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COMPUTERWORLD

PC prices tumble, yet budgets on the rise

By Jaikumar Vijayan

Hardware prices may be falling, but corporate PC spending seems to be heading skyward next year. So what gives?

Well, the emerging generation of sophisticated and power-hungry 32-bit operating systems are driving up overall costs.

Corporations spent most of their PC hardware bucks this year on relatively high-ticket Pentium PCs and upgrades to take advantage of the Windows 95 and Windows NT environments. Even Windows 3.1 upgrades are claiming their share of the fatter hardware budget, many companies have found.

PC prices, *page 141*

Service firms latest entrant on the Web

By Kim S. Nash

Imagine you've moved from Minnesota to Florida with your family and your dachshund, but little Schnitzel doesn't take well to the upheaval and develops a heart condition.

How are you going to find a trustworthy canine cardiologist in your new town?

VetFind, that's how. It's a World Wide Web site with listings of dozens of U.S. veterinarians, along with fees and other business information. VetFind is just a recent example of how rivals have begun to use the Web to do something they would never do on terra firma: build single-industry shopping malls that make it easy for customers to comparison shop.

Insurance companies, real estate agents, plumbing suppliers and many other firms in distinct vertical industries have begun cavorting on the Web.

The Web "is more effective and less costly than older, traditional [marketing] methods," said Tom Newton, vice president of marketing at Grocers Insurance Group, Inc., a Portland, Ore.-based insurance company for grocery stores.

Service, *page 66*

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Capitulation!

Microsoft to license Java; Internet standards war avoided

By Stuart J. Johnston and Kim S. Nash

Faced with a potential waterloo, Microsoft Corp. swiftly changed course last week and embraced a strategy designed to avert an Internet standards war.

Internet strategies

The company opted to license the Java Internet programming language from rival Sun Microsystems, Inc., giving an unexpected blessing to one of its most dangerous and direct competitors.

Microsoft Chairman Bill Gates said his company will also leverage its technology for the desktop — in the form of object-based OLE controls, or OCXs — to make headway on Internet application development. OCX objects can be used in Microsoft's Visual C++ and Visual Basic programs to build features for users' display screens.

"Today, Cobol, Visual Basic and C are 90% of what goes on" in platform-independent languages, Gates said. "Now, Java is the best candidate to come along for quite some time to be added to that list."

Microsoft won't form an Internet division, Gates said. "That would be like forming an elec-

Microsoft, *page 141*

AS/400 users hit capacity wall, fret about RISC delays

By Craig Stedman

RISC-based AS/400s are coming. But they're not coming fast enough for some big users of IBM's midrange system.

When delayed multiprocessors based on the PowerPC architecture ship in late March, two years will have gone by since the AS/400's last performance boost. That is proving to be too long a wait for some top customers who are hitting the throughput wall with their systems.

Several big users said they already have taken stopgap measures to increase capacity or will need to do so early next year. Unplanned purchases of additional non-RISC AS/400s could postpone their migration to the new hardware, they added.

Most AS/400 users aren't feeling the crunch, however. And users and analysts credit IBM for seeking out power-starved shops and trying to help them through the waiting period with discounts on interim machines and other forms of assistance. But hundreds of IBM's big-name customers may need more than the non-RISC machines can deliver.

Pain but no gain

But for some of IBM's best customers, the experience is adding complexity and creating the potential for unwanted costs. "I'm looking at paying double to get a cobbled-together solution with some nasty depreciation," said Marc Cohn, senior vice president of information systems at Enterprise Rent A Car Co. in St. Louis.

Enterprise has 19 big AS/400s, and Cohn said he is "90%-plus certain" the company will have to

AS/400, *page 141*

COMPUTERWORLD INVESTIGATION

Ticket to Nowhere?

Companies in need of warm bodies for programming chores may be looking to an unusual source — mail-order schools. In a new *Computerworld* survey, 58% of 200 companies say they'd consider hiring entry-level coders with certificates from these schools.

But a *Computerworld* investigation has found that the correspondence schools' questionable marketing practices and outdated curricula have soured would-be programming students and made IS chiefs wary. In fact, only 2% of survey respondents say they have actually hired anyone with such a background.

SEE IN DEPTH, PAGE 105

ROGER RESNICK

Would-be coder Phillip Johnson is disillusioned with mail-order schools

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Inside Computerworld

Dec. 11, 1995

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Notes 4.0 pricing, link to CC:Mail still unclear

By Suruchi Mohan

Lotus Development Corp. will fill in the blanks this week for users who need to mix and match Notes with their CC:Mail environments.

The IBM subsidiary will talk about its upcoming launch of Notes Version 4.0. It also will give updates on its communications strategy and announce a new pricing structure for Notes.

Users say they are confused by varying reports of a new pricing structure for Notes. Lotus representatives have quoted new prices anywhere from $40 to $99 for the "lite" equivalent of the Notes desktop client, which currently costs $150 per seat for 50 users.

Lotus is still scrambling to price Notes aggressively, said John Parkinson, a partner at Ernst & Young in Irving, Texas, who was briefed by Lotus. The vendor declined to comment.

The Notes 4.0 "lite" client *will be analogous to the desktop version of Notes 3.0, says Barry McCurdy, senior vice president and director of research at First Albany Corp.*

The highlights of Lotus' announcements include the following:

- CC:Mail 7.0 is entering beta testing, and its 32-bit client will be shown for the first time.
- Details about connecting CC:Mail with Notes Version 4.0, which ships at the end of this month with a built-in World Wide Web browser.
- Ship dates for CC:Mail 7.0, expected to be at the end of the second quarter.

Lotus also is expected to announce details about its so-called Notes Lite desktop, which will come as an option with Version 4.0. This will be similar to the Notes desktop client but will lack the design capabilities. Whatever the final price cuts for the desktop client are, customers naturally are glad to see them coming.

"Users won't mind the price cuts even if they [originally] paid more," said Michael Kran, president of the Lotus Notes Users Group in San Francisco. A price cut makes it easier to add more Notes clients after the expensive infrastructure has been installed, Kran said.

But key pieces of the infrastructure Lotus has been promising for the past year — the Lotus Communications Architecture — are still missing.

The new packages Lotus has been describing essentially split the processing of information between the client and the server. This contrasts with the current generation of file-sharing electronic-mail systems in which the server handles all the processing.

Central to Lotus' strategy is the idea of mixing and matching client/server and file-sharing components so users can migrate gradually to a client/server environment whenever they want [CW, Oct. 2].

But those plans have been delayed for months.

Waiting for the mail

Now, Lotus is finding itself unable to deliver CC:Mail 7.0, the client/server version, within the promised time frame. CC:Mail has an estimated 7 million users.

In the absence of a client/server version of CC:Mail, users will be asked to use the Lotus Mail Exchange Facility, a gateway between Notes and CC:Mail.

The delay is "substantially hampering" the Notes rollout at the Internal Revenue Service in Austin, Texas, because it is harder to persuade users to upgrade, said Thomas Bridges, a network administrator.

"If we don't see a clearer migration from CC:Mail to the Notes desktop and the integration of the two," it is going to be hard to get users to upgrade, Bridges said.

Hackers exploit Win 95 password

By Gary H. Anthes

An international group of hackers has discovered flaws in the way Windows 95 encrypts and stores sensitive system passwords. The flaws would enable anyone with simple cracking software to unscramble and use passwords stored on the PC.

In a notice to its clients last week, IDC Government in Falls Church, Va., said the hackers, who call themselves "cyberpunks," had used a 100-line C program to "break the encrypted password file in minutes."

The problem is that Windows 95 uses 32-bit encryption keys, which are much easier to break with a "brute force attack" than the 40-bit key broken last summer by a French student [CW, Aug. 28], said John Pescatore, research director for information security at IDC Government.

Cyberbandits

In addition, the encrypted files contain the user name. That gives the cracking software something recognizable to look for as it tries different decryption keys.

"It's a mistake, a bug in the product," said Michael Ahern, Windows 95 product manager at Microsoft Corp. A fix was being tested last week and will be posted later this week to the company's Internet World Wide Web site, http://www.microsoft.com.

Pescatore urged Windows 95 users to install the Microsoft fix as soon as it is available. For others, he recommended skipping Windows 95 and waiting for the next version of Windows NT.

Ahern said part of the problem stemmed from the fact that the operating system didn't generate completely random keys, a flaw that also tripped up the encryption scheme used earlier by Netscape Communications Corp. [CW, Sept. 25]. The fix will involve more randomness as well as longer key lengths, he said.

"The whole encryption scheme used by Microsoft in Windows 95 is a bad joke," said a Finnish hacker on the 'net last week. "I find this kind of 'security' shocking."

Last Monday, a hacker in Norway posted a C program that he said would crack Windows 95 passwords. The next day a cyberpunk in Austria posted this review: "I have just tried [the] program for cracking [password] files. It indeed works. With it, I could obtain the plain text passwords ... in less than a second. This is very bad."

But Ahern noted that getting the password file requires physical access to the PC in most cases. "The real risk is when you're out to lunch and someone comes into your office with a floppy and grabs the file from you," he said.

Apple throws support to PowerPC clone maker

By Jaikumar Vijayan

Exponential Technology, Inc., a closely held Silicon Valley start-up, last week announced it will manufacture the first PowerPC clone chips, due out in early 1997.

RISC chips

The company, which has so far raised about $14 million in funding from venture capitalists, has received active backing from investor Apple Computer, Inc., one of three partners in the joint venture to build the PowerPC chip.

The first chip clones will be two to three times faster than comparable PowerPC chips when running Apple and PC software, Exponential officials said.

Unlike most current chips, which are based on smaller and cooler CMOS technology, Exponential's PowerPC clones will use a variation of an older manufacturing process technology called bipolar. That process will incorporate CMOS memory with bipolar logic on the same chip.

"There is a credible argument that says these guys can build chips that are faster than pure CMOS," said Michael Slater, editor of "The Microprocessor Report" in Sebastopol, Calif. "It is an interesting technology bet that may or may not pay off" because few other chip vendors have used such a technology before, he said.

NetWare 4.1 to work with rivals

By Laura DiDio

Within the next three months, Novell, Inc. will bow to user demand and introduce software that lets businesses easily integrate NetWare 4.1 with other network operating systems, including rival Microsoft Corp.'s Windows NT Server.

Michael Simpson, a Novell product manager, told *Computerworld* that Novell will release three free software components that provide users with key integration capabilities.

This type of connectivity between NetWare and other network operating systems is crucial because users typically have several such systems installed at their sites, said Bob Sakakeeny, an analyst at Aberdeen Group, Inc. in Boston.

More significantly, Provo, Utah-based Novell has lagged behind Microsoft in delivering software that bridges NetWare with Windows NT Server and Workstation and Windows 95 environments.

"It's about time. I've needed this type of functionality for months now," said a network administrator at an oil firm that has NetWare and NT Server.

Customer is always right

Novell realizes it is time to "call the battle off and give users what they want — seamless cross-platform connectivity," Sakakeeny said.

The forthcoming NetWare software, which is already in use at several large shops, includes the following:

- Server-level account migration that enables network administrators to migrate users from NT Server, legacy LAN Manager and IBM's OS/2 LAN Server to NetWare.
- A Server Message Block NetWare Loadable Module, which lets administrators integrate NetWare servers with IBM OS/2 LAN Server, LAN Manager or Windows NT networks without changing any of the client workstation utilities.
- Windows NT Server application server integration, which will let companies meld applications between NT Server and NetWare environments.

"The downside is that users may use the software to make it easy to integrate NT into the NetWare environment and ultimately toss NetWare out the door," Sakakeeny said. "But it's a gamble Novell has to take."

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Switch vendors slash prices to move hubs

By Bob Wallace

Big Blue is having a blue-light special. And so are its competitors.

Users stand to save thousands of dollars — and get an early handle on advanced technologies — as IBM, Cisco Systems, Inc. and Alantec Corp. offer deep price cuts to help move switching hubs.

"These vendors are making offers users can't refuse," said Daniel Briere, president of TeleChoice, Inc., a Verona, N.J., consultancy. "Christmas has come a little bit early in the internetworking industry."

For example, IBM has launched a promotion whereby users buying its base 8260 Intelligent Switching Hub can get the Asynchronous Transfer Mode (ATM) version at no extra charge, *Computerworld* has learned.

"That's a savings of almost $3,000, which is pretty sizable and rare in this industry," said an IBM source who requested anonymity.

The 8260 with the ATM backplane supports higher-speed switching than today's switches and has the extra horsepower needed to anchor buildingwide LAN internetworks.

Users applaud

Users, not surprisingly, are excited about the promotions.

"Isn't competition wonderful?" asked Steve Flis, oetwork manager at Metro West Medical Center in Framingham, Mass., a 600-bed facility with 3Com Corp. and Chipcom Corp. equipment. "I'd love to see 3Com join the gang and knock down some of its product prices."

Briere predicted that other vendors will do just that.

Indeed, Alantec last week introduced a line of 10/100 Fast Ethernet switches with low promotional pricing. This will let users cash in on Fast Ethernet technology in the workgroup, where the switches provide a dedicated 10M bit/sec. or 100M bit/sec. pipe per desktop, or in backbone network scenarios and save thousands of dollars.

For example, the PowerHub 4101 with six Fast Ethernet ports and four switched Ethernet ports costs $7,950 until January, when the price of the box will rise to $10,950.

Others follow suit

Alantec also announced promotional pricing for the PowerHub 4000, which was rolled out earlier this year. A PowerHub 4001 costs $3,995 until January, when the price goes back up to $6,950 — a savings, for oow, of roughly $3,000.

Cisco joined the fray by offering osers of its LightStream 100 ATM switch a credit equal to half of what they paid for that ATM switch toward the $19,000 base price on the new LightStream 10/10 ATM switch. "And there's a world of difference in functionality," a Cisco spokesman said.

IBM will bundle OS/2 on servers

By Bob Francis

IBM will begin a new software bundling strategy next year when it offers servers preloaded with OS/2 and a wide variety of applications.

The strategy is intended to shore up the company's flagging operating system and deliver an alternative to Microsoft Corp.'s BackOffice strategy. It will he expanded later in the year with more applications and additional operating systems, possibly even Microsoft's Windows NT.

The initial packages will be Big Blue through and through: OS/2 bundles, with a variety of home-grown systems management, database, communicatioa and messaging products running on IBM PC servers. Future offerings will include CICS, Internet and Lotus Development Corp. applications such as Notes.

Software strategies

The Armonk, N.Y., company will announce the program, code-named Project Eagle, early next year as an alternative for users and resellers wary of loading OS/2 on their own. IBM officials wouldn't comment on specifics of the plan.

IBM reportedly will offer the bundles to other PC hardware vendors, said sources briefed by the company last week. It will offer the bundles on its RS/6000 Unix servers but may also add support for other Unix operating systems such as Hewlett-Packard Co.'s HP-UX, sources said.

Users lauded the notion of making OS/2 installatioo and delivery easier.

"We've been using OS/2 for several years, so we know how to load it. But for new users, it could ease their way into the operating system," said Virgil Pittman, senior vice president of information systems at Fireman's Fund Insurance Co. in Novato, Calif.

Pittman said he likes the continuing signs of IBM's faith in OS/2, despite gains made by Windows NT. "I've always been confident that IBM will support OS/2 on the corporate side no matter what happens at the client level," Pittman said. "But this program gives them another way to gain new users for OS/2."

Fireman's Fund has used OS/2 since 1988 and currently has 150 OS/2 servers.

OS/2 could use additional support from other IBM groups such as the PC server group, said Paul Strauss, an analyst at Sentry Market Research in Westboro, Mass.

Sentry's research indicates that among large sites that use OS/2 as a server, only 17% plan additional OS/2 servers by the end of the year — the lowest growth rate for PC or Unix operating systems.

"IBM has to do something to improve the perceptions of OS/2," Strauss said.

The program will also give IBM's server group a way to counter Compaq Computer Corp., which is beginning to offer preloaded packages, such as Microsoft's BackOffice, on its servers.

CommonPoint plans halted

Dissolution of joint Taligent venture leaves development plans up in the air

By Frank Hayes

Developers hoping to use Taligent, Inc.'s technology for cross-platform application development appear to be out of luck, as IBM prepares to absorb its doomed partnership venture with Apple Computer, Inc and Hewlett-Packard Co.

Taligent was in the midst of developing CommonPoint, a C++ development system for building applications that could be ported easily between Windows NT, OS/2 and several versions of Unix.

But while IBM is quietly telling business partners it will absorb Taligent as a wholly owned software subsidiary, the Cupertino, Calif.-based joint venture officially remains in legal limbo.

Job losses

Sources close to Taligent said most of the firm's sales and marketing staff will lose their jobs. But IBM intends to keep software engineering staff at the site in Cupertino, Calif., the sources said.

Now, most of those versions of CommonPoint are in limbo, too. Only the AIX version and the OS/2 beta version have been available to customers.

"We are very much committed to Windows here, and I was hoping for the NT version oext year," said Jeff Jurvis, a development center consultant at the St. Paul Fire and Marine Insurance Co. in St. Paul, Minn.

Jurvis, who has used early versions of CommonPoint, said he didn't expect IBM to work on an NT version or eveo "do much with the Taligent technology at all."

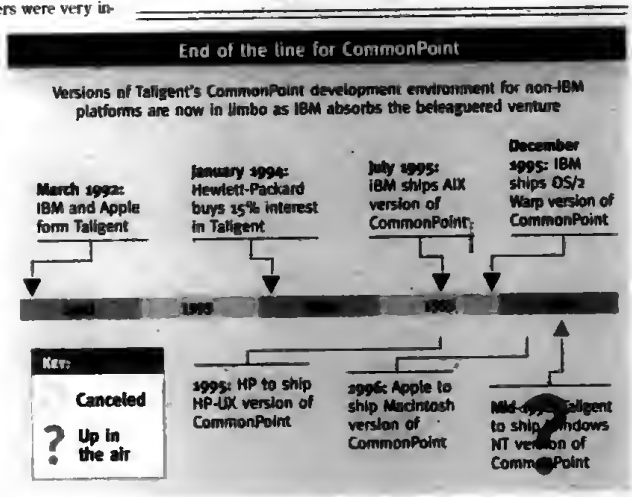
"There's some great technology, and it still has a future," said another corporate developer who is using the OS/2 beta version of CommonPoint. But will IBM develop that technology to help Windows NT compete against OS/2? Not likely, "They might as well put a gun to their head and pull the trigger," he said.

Officials from IBM, Apple and HP declined to comment publicly on the future of Taligent or the fate of the CommonPoint technology on their respective platforms.

But one business partner briefed by IBM last week said the company plans to separate CommonPoint's C++ libraries from the development system and use them in a variety of IBM object-oriented development products.

"The feedback IBM was getting was that customers were very interested in Taligent, but they didn't want to buy the whole environment overhead just to get the C++ frameworks," said Stephan Adams, president of Adamations, Inc. in Oakland, Calif.

IBM still plans to ship the OS/2 version of CommonPoint this week, Adams said. But it had nothiog to say about a versioo for Windows 95 or NT.



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Shiva, Motorola set remote pact

By Mindy Blodgett

Communications leaders Motorola, Inc. and Shiva Corp. this week will join forces in a bid to forge a higher profile in the enterprise remote access market.

The companies have agreed to work on enhancing the Motorola 925 System, a bandwidth management and network access system that runs as many as 48 analog data channels over high-speed T1 lines.

Representatives of the companies revealed few details about the improved system, which is slated for introduction early next year. But they claimed that their combined expertise will result in a product that provides high-speed individual access and enterprise-wide communications.

They said the as-yet unpriced product will provide a wide range of communications modes, including analog and Integrated Services Digital Network (ISDN). The system also will enable the use of more than one mode at once.

Motorola will market the new system, which will use some of Shiva's LanRover remote access software.

The target market comprises telecommunications carriers, Internet service providers and large corporations.

Leon Martin, a senior network specialist at the Gift Certificate Center in Minneapolis, uses the Motorola 925 System to provide dial-in access for more than 100 customers nationwide.

He said he is happy with the system's ability to integrate LANs and WANs and to manage modems, digital devices and voice and video over T1 lines. But he said he is looking for the increased ISDN capacity forecast for the product.

"We're going to be growing our systems at about 10 times [the] current level," Martin said. "There will be many more customers needing dial-in access for credit checks and that sort of thing."

Pocket change

The Motorola 925 System costs from $29,995 for a 24-channel system to $59,450 for a 48-channel system.

Pentium bug didn't bite sales, but it woke up Intel

By Jaikumar Vijayan

One year later, it seems the bark was indeed worse than the bite.

After all the noise Intel Corp.'s infamous Pentium bug generated this time last year, the issue died away with nary a whimper.

"The aftermath has shown that Intel is a tough company and that the whole issue was blown way out of proportion," said Dean McCarron, an analyst at Mercury Research, Inc. in Scottsdale, Ariz.

Consider the following:

- The number of chips exchanged because they contained the so-called floating-point flaw may be slightly below most estimates. Mercury Research estimates that about 20% of the flawed chips have been returned. Last year, analysts predicted that 30% to 70% of the estimated 4 million chips that had shipped at that time would be returned.
- There has been no financial impact on Intel apart from the $475 million charge the company set aside last year toward costs associated with replacing the flawed chips.
- Pentium sales continue to boom. Analysts say the Pentium bug didn't cause even a temporary blip on Intel's radar screen.

The controversy did, however, influence how the company will handle such issues in future. Intel in Santa Clara, Calif., has a policy of making publicly available, on request, any technical details relating to bugs on chips before the chips are released.

"The market does not want us deciding what we think is significant for them," a company spokesman said.

News Shorts

Adobe jumps on bandwagon, licenses Java

Adobe Systems, Inc. has signed an agreement with **Sun Microsystems, Inc.** to license Sun's Java programming language. Adobe will integrate Java applets into Adobe's Acrobat electronic document software and PageMill Web authoring software. It may eventually integrate Java into all of its products.

SCO closes Novell deal

SCO, Inc. has closed on its $60 million deal to purchase **Novell, Inc.**'s Unix business [CW, Sept. 25]. SCO said last week that a phased migration will merge SCO OpenServer and Novell's UnixWare into a "Gemini" product by 1997. A merger of Hewlett-Packard Co.'s HP-UX Unix with Gemini is expected by 1998, with both 32- and 64-bit versions for users.

Cadence accuses Avant of theft

Cadence Design Systems, Inc. is suing electronic design software rival **Avant Corp.**, claiming Avant employees stole proprietary computer code from Cadence's products. The suit names Avant Chairman Gerald C. Hsu, a former Cadence executive, and three other former Cadence employees who now work for Avant. Cadence CEO Joseph Costello called Avant a company built on stolen intellectual property; an Avant spokeswoman denied any wrongdoing.

Powersoft fights PC fat

Powersoft Corp. has shipped a beta copy of an updated version of PowerBuilder that is supposed to solve a major weight problem for applications developed with the popular visual development system. PowerBuilder 5.0 targets applications that are simply too fat for a PC by allowing developers to split the software between a client PC and a larger server, according to the Concord, Mass.-based division of Sybase, Inc.

SmartSwitch pricing revealed

Cabletron Systems, Inc. is pricing its SmartSwitch switching line at $3,595 for a stand-alone three-slot WorkGroup SmartSwitch, which can be equipped with the $13,695 SmartSwitch Controller Module. Due to ship in 90 days, the product line also includes the $2,595 MMAC SmartSwitch.

Hollis leaving First Chicago

Donald R. Hollis, executive vice president and chief information officer at **First Chicago Corp.**, will retire from the Chicago-based bank next April, *Computerworld* has learned. Hollis, 60, is taking early retirement.

IBM sues former PC exec

IBM is suing Bruce Claflin, a former general manager of its PC Co., for exercising a lucrative package of stock options, worth an estimated $1 million, just before he quit IBM. Under the program, IBM can ask for its money back if an employee leaves the company to join a competitor within six months. Claflin quit IBM to head **Digital Equipment Corp.**'s PC business a month after he exercised his stock options at IBM. Digital last week said, "Claflin's departure from IBM and hiring by Digital were entirely appropriate." IBM did not return calls.

What's in a name?

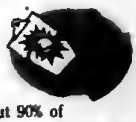
The Open Software Foundation last week approved a project to build a unified naming system for network services by 1997. XFN will allow any client machine to use a unified directory scheme to dial up network services such as Novell's NetWare.

DEC demos 96-chip array

Digital demonstrated an array of 12 eight-way AlphaServer 8400s to handle high-end technical and scientific computing tasks at last week's Supercomputing '95 show in San Diego. Digital said the 96-processor array uses special interface cards to combine the servers, which together churn up to 57.6 billion floating-point operations per second at a price of $4.5 million.

MVS aspires to openness

You may not be able to mention the words "MVS" and "proprietary" in the same sentence anymore. Sources said **IBM** will announce this week that the crown jewel of its mainframe operating systems now has XPG4 Base branding as an open system from X/Open Co. Ltd. MVS 5.2.2, the most recent release, supports about 90% of the application programming interfaces in the industry-standard Single Unix Specification. IBM said it hopes to get full XPG4 branding next year.



HP sets Oracle link

Hewlett-Packard Co. plans in the first quarter of next year to enable its data warehouse software to work with **Oracle Corp.**'s Oracle Express on-line analytical processing database engine.

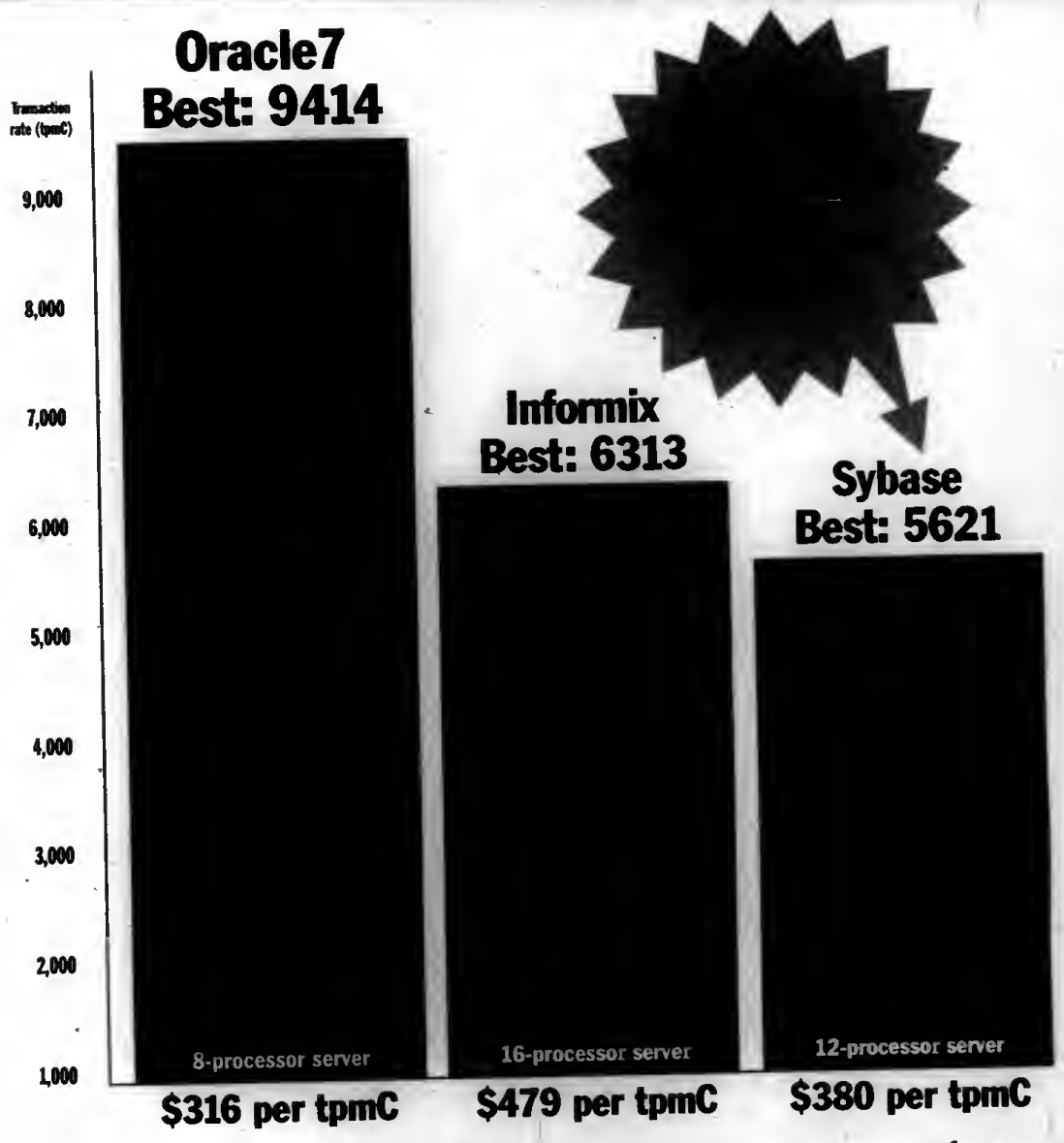
NASA triples Cray power

The National Aeronautics and Space Administration's Center for Computational Sciences in Greenbelt, Md., is tripling its computing power by switching from a Cray Research, Inc. C90 supercomputer to a cluster with three of Cray's lower-cost J932 systems. The J932 cluster will include 68 processors when first installed next year. It is scheduled to be expanded to 96 nodes by year's end.

Oracle licenses Solaris 2.5

Oracle said last week it has licensed Sun's Solaris 2.5 Unix operating system as part of Oracle's bundled InterOffice PC-based database server system for branch offices. The InterOffice workgroup server, code-named BandWagon [CW, Dec. 4], will be announced this week and will be available for Windows NT.

Oracle7: Faster, Cheaper, Better



The TPC-C is the industry standard test for measuring database transaction processing performance and price/performance. Oracle7's best TPC-C result is 60% faster than Sybase's best result. What is more amazing, Sybase used its yet to be released Sybase SQL Server 11 database and 50% more processors to achieve roughly half of Oracle7's performance. Informix used twice as many processors as Oracle and delivered 32% less performance. And the Oracle7 system costs much less than either Sybase or Informix. Think about it. Then call Oracle 1-800-633-1071, ext. 8107.

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Users laud OpenVMS revival

By Michael Goldberg
SAN FRANCISCO

Longtime users of Digital Equipment Corp.'s OpenVMS systems held a kind of revival meeting here last week, celebrating the renewed vitality of an old friend once feared deathly ill.

"Like night and day" was the difference in spirit between this user group meeting and last year's grim gathering, said Wendell Mason, a systems manager at Westinghouse Savannah River Co. in Aiken, S.C.

Digital and Oracle Corp. promised to make it easier for users to integrate applicatioos running oo Windows NT with OpenVMS servers.

Digital unveiled OpenVMS Version 7.0, a 64-bit operating system with a new file system that allows for continuous backup and provides kernel threads for distributed application processing [CW, Nov. 13].

Version 7.0 is part of a Digital program to help users integrate their OpenVMS systems with NT applications [CW, Dec. 4]. Another round of software products to improve OpenVMS and NT integration is set to be released in June (see chart).

Oracle, which last year bought the Rdb database from Digital, pledged its long-term commitmeot to the product. Rdb7, a 64-bit version designed for large memory systems, will be ready to run on OpenVMS in the second quarter of 1996, Oracle officials said.

That version will allow users to keep 14G bytes of data in memory instead of on disk, increasing transaction speed. Rdb7 will include graphical user interfaces for administrators and a "hot standby" option that allows continuous backup of a database system on a server in a remote location. Pricing will be available in January.

"Version 7.0 is an incredibly attractive product for any Rdb user," said Jeffrey Jalbert, president of JCC Consulting, Inc. in Glenville, Ohio.

Too soon to predict success

Users and observers said it is still too early to generate a long-range forecast for OpenVMS. Digital has done a good job in the first wave of its OpeoVMS-to-Windows NT Affinity program, but more needs to come, they said.

"Digital has to position [OpenVMS] as something that is not a legacy system, but something you'd want to buy into today," said Jonathan Eunice, an analyst at Illuminata in Nashua, N.H. "It's feasible, but it requires they say [OpenVMS] is better than Unix or NT."

Still, established OpenVMS users said they like what they see so far.

"The Windows NT/VMS connection is exactly what we need," said Robert Steven van Keuren, a senior program analyst at Action Instruments, Inc. in San Diego.

The company, which makes industrial I/O devices, has been a VMS shop for 20 years and is evaluating a oew system purchase.

Affinity for NT

Digital plans to unveil a second round of features and software products for OpenVMS-to-Windows NT integration in June. They include:

- Internet and Web tools for OpenVMS servers, such as firewalls and Netscape Web browser software
- New memory channel technology for OpenVMS systems to speed up data transfers between clustered servers
- LAN management software to monitor Windows PC clients and Windows NT and OpenVMS servers via a Windows NT workstation
- Adding Microsoft's OLE to OpenVMS to aid application developers
- Messaging software for OpenVMS servers to support forthcoming Microsoft Exchange clients

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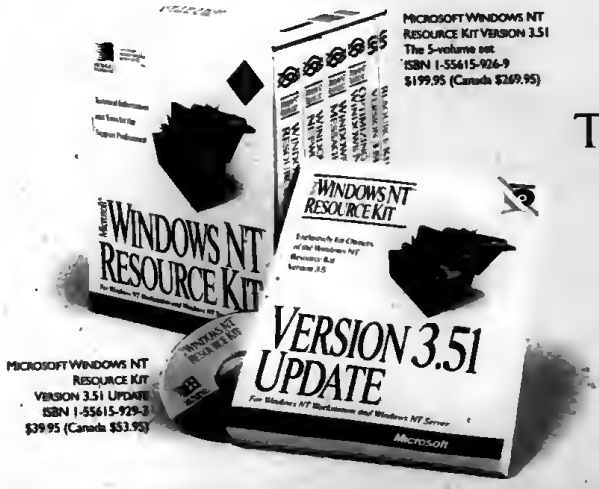

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Cabletron spreads Spectrum message

By Patrick Dryden

A flurry of partnerships with Cabletron Systems, Inc. revolves around Spectrum for Open Systems, signaling that the network management platform will soon monitor more than hubs and routers.

Network management

Spectrum is gaining recognition for its distributed architecture and "network knowledge base," a database that models physical and abstract management objects throughout client/server environments. New partners are calling on Spectrum to manage devices as diverse as storage subsystems, private branch exchanges (PBX) and cable TV gear.

"Few believed Cabletron's path — an open manager of managers — when they started, but these deals prove they were right," said Bob Currier, director of data communications at Duke University. "Spectrum can manage anything that sits on a network through the hooks built in to that knowledge base."

Although he has no immediate need to manage telephone and television devices, Currier said he must prepare for the convergence of networks. The new Office of Information Technology is responsible for data, video and telephone networks at the university.

"We absolutely want to maintain a single console for monitoring any device, to build on operator experience and save on training," Currier said. "It's promising that we can look forward to handling it all with Spectrum."

Tight integration

Storage Computer Corp. this week rolls out a monitor for its multiserver disk subsystem that can send alerts to many popular consoles (see story below).

But the Nashua, N.H., developer promises tight integration and a graphical module for Spectrum, based on the needs of mutual users such as New York-based Teachers Insurance. The management combination will automate alert notification to improve service levels for users and lower costs of operation, according to Joji Joseph, senior MIS consultant.

Nortel, Inc. last week adopted Spectrum and internetworking gear from Cabletron for internal use. Both partners pledged to develop Spectrum management modules for Nortel's Meridian 1 PBX systems and Norstar digital key systems.

And recently, Boston-based Continental Cablevision, Inc. chose Spectrum to build a subscriber management system that will bring high-speed data connections to homes via cable TV networks.

Still to come is a graphical PowerNet module for managing uninterruptible power supply systems from American Power Conversion Corp. in West Kingston, R.I. The U.S. Postal Service wants to monitor those systems on routers and hubs along with an increasing mix of other vital network elements, said Dan McPhillips, telecommunications program manager.

"We like to do our troubleshooting remotely, so it would be nice to see more devices manageable through Spectrum in the future," McPhillips said.

Cisco adds management utilities. See page 63.

Spectrum support

Cabletron and new partners are plugging diverse devices into the network modeling database of the Spectrum management platform

Partner	Using Spectrum to:
American Power Conversion West Kingston, R.I.	Manage uninterruptible power supplies for hubs, routers and servers via PowerNet graphical interface
Continental Cablevision Boston	Manage cable TV probes, broadband Ethernet links and LightStream ATM switches
Nortel Dallas	Manage Nortel Meridian 1 PBX systems and Norstar digital key systems
Storage Computer Nashua, N.H.	Manage Storage Computer's RAID 7 Storage Servers

Another view for SNMP

Storage Computer is offering a monitoring option that reports networkwide using the Simple Network Management Protocol (SNMP). The option works on the company's drive array subsystem.

A single new Storage Administrator chassis can house SNMP proxy agents for up to 16 RAID 7 Storage Servers, according to company. These units provide an operating system that controls file functions so each can be shared by multiple, heterogeneous servers.

Storage Administrator communicates via SNMP so popular network management consoles can receive basic status information. It will ship this month, starting at $5,500 for a single Storage Server attachment.

Those equipped with Cabletron's Spectrum network management platform will get the best view into Storage Administrator. There managers will be able to see multiple links and logical data configurations because Spectrum's architecture can model such complex management objects, according to Storage Computer officials.

Next year, Storage Computer plans a fully graphical module for Spectrum that eventually will integrate with the platform's upcoming performance monitor and case-based reasoning tool.

— Patrick Dryden

HP probes check network health, but data analysis still a specialty

By Patrick Dryden

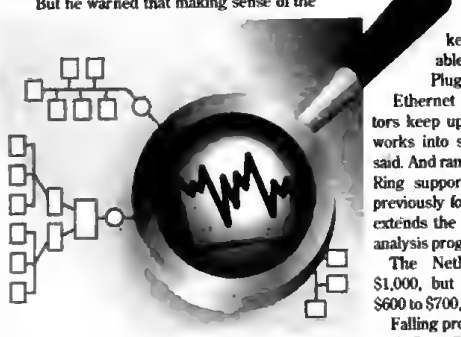
Hewlett-Packard Co. this week will take three big steps toward enabling end-to-end evaluation of network performance with the debut of enhanced NetMetrix remote monitoring tools.

These introductions set the stage for the planned integration next month of NetMetrix internetwork analysis programs with PerfView, which analyzes the performance of systems and applications, *Computerworld* has learned.

HP's expanded support for probes — early-warning outposts that track traffic changes — seeks to help administrators of distributed client/server networks keep track of data flowing through an enterprise. Many administrators would like to proactively monitor performance of the overall network instead of merely reacting to alarms and outages.

"Now HP has the pieces to track application performance across the entire network," said Brian Burba, network management analyst at International Data Corp. in Framingham, Mass.

But he warned that making sense of the data gathered from probes remains difficult. "The challenge is to make this idiot-proof. Nobody is there yet, but HP is leading the way," Burba said.



A low-cost probe for Ethernet LANs, another probe that can monitor Fiber Distributed Data Interface (FDDI) backbones, and enhancements for Token Ring LANs all are available this month.

Plugging in the new, cheaper Ethernet probes helps administrators keep up as they chop their networks into smaller segments, Burba said. And ramping up FDDI and Token Ring support to match that offered previously for Ethernet environments extends the capabilities of NetMetrix analysis programs.

The NetMetrix Probe lists for $1,000, but street prices should be $600 to $700, HP officials predict.

Falling probe prices are good news, said Tom Bain, research analyst at Meta Group, Inc. in Westport, Conn. Still, because Ethernet networks are subdividing so fast, "users can't afford to put one everywhere, even at $50 each," Bain said.

HP's latest probe forsakes packet-capture capability to keep its price low. That is fine with Michael Hardy, telecommunications specialist at Chrysler Corp. He said he is interested in using the new probe for local LANs, where troubleshooters with full-blown protocol analyzers are handy to trace problems. Inability to capture packets would be a problem at remote sites that lack technicians who can provide prompt response, Hardy said.

HP's overhaul of its Token Ring support is good news for Hardy because he is deploying both HP models. "The probes and monitoring software give us an excellent low-cost method for ongoing network performance analysis," he said. The FDDI LanProbe for monitoring backbone traffic costs between $9,995 and $19,995 per memory and interface options.

HP has extended its NetMetrix line significantly, but no vendor can legitimately claim to offer end-to-end network performance analysis, Bain said. "Everyone is missing one piece or another. HP lacks recognition of specific applications like the major databases, for example."

Stop playing games with your network! See page 63.

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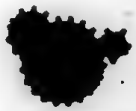

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Feds probe Microsoft's 'net browser blocker

By Stuart J. Johnston

The Justice Department is investigating the latest allegation leveled at Microsoft Corp., namely that its Internet browser breaks competitors' browsers.

At issue is that when a user who already has a third-party browser installs Microsoft's Internet Explorer, the original browser unexpectedly stops working.

Microsoft denies any deliberate intent to block third-party browsers. Several analysts, users and industry consultants agree with Microsoft, but the company's competitors and detractors claim it is an extremely subtle plot designed to give the company a leg up in the Internet race.

According to several technical experts and Microsoft's technical support people, what has been kicking in here is a combination of factors that weren't intended to disable third-party browsers.

Dodging the DOJ

The Department of Justice will continue to monitor Microsoft's business practices in several areas, even beyond the scope of the limited consent decree Microsoft signed with the DOJ in July 1994

TIME FRAME	INVESTIGATION	DECISION
October 1994/ May 1995	Proposed acquisition of Intuit	Move blocked
Summer 1995	Bundling of The Microsoft Network clients with Windows 95	No action to date
December 1995	Whether Microsoft's Internet browser, when installed, purposely disables third-party browsers	Probe ongoing

At the core

The heart of the issue is WINSOCK.DLL, a low-level file that is needed to operate on the Internet's TCP/IP protocol. Microsoft wrote the file several years ago as a Windows version of the Unix-based Berkeley Sockets. Some browser vendors customized WINSOCK by adding extensions and then installed their oew versions in Windows' main directory, thus overwriting any pre-existing WINSOCK.

Microsoft created a 32-bit version of WINSOCK for Windows 95. When users installed the Internet Explorer, they also received the new version of WINSOCK, which wouldn't work with browsers that have their own custom versions. These include Spry's Mosaic in a Box and CompuServe, Inc.'s NetLauncher.

Fixing the problem isn't as simple as copying the browser vendor's custom WINSOCK back into the Windows directory. Windows 95 has a special feature designed to keep users from accidentally damaging systems files. When those files are changed, the feature kicks in the next time Windows 95 is started up and changes back any files that were changed. This feature can be overridden by restarting the PC in MS-DOS mode and then changing the file.

Microsoft conspiracy or not, the result is the same, and that is a problem, said David Poole, executive vice president for strategic development at CompuServe io Columbus, Ohio. "For most people, including myself, the issue is that people will do what's simplest," which means they will use Microsoft's browser instead of trying to make the old one work again, Poole said.

The fix is in

The problems have been well-known for nearly a year, and there are ways to circumvent them.

The simplest solution is to install the browser vendor's version in the browser's directory instead of the Windows directory. CompuServe issued a fix that usea this method soon after Windows 95 shipped and has fixed the problem in its browser. In fact, Microsoft announced last week that it has licensed its Internet Explorer to CompuServe.

Corporate Internet users will have an easier time than consumers because they can rely on IS staffs with the knowledge to quickly fix it, Poole said.

Constant scrutiny exacts painful toll

By Lisa Picarille and Stuart J. Johnston

Like it or not, regulatory oversigbt is fast becoming a fact of life for desktop standard-setter Microsoft Corp.

As the industry hurtles toward the year 2000, observers will closely watch the extent to which competitors take advantage of the situation. A key questioo will be whether Microsoft can buck the distractions and remain focused.

At least ooe Wall Street analyst claimed that some users with purchasing power are starting to take note of — and factor into their decision-making — the impact these complaints have on Microsoft's stock price.

"I can see users purchasing Internet server software based on a high stock price. Some people use the stock price as an indicator of who's leading the pack," agreed Neil McManus, executive editor of "Digital Media," an industry newsletter in San Francisco.

"Microsoft has lived off this mentality in the PC software business for years. And it's more comfortable psychologically to go with the leader. Users usually attribute one success, whether it is financial or technical, to another possible future success," he explained.

Stock watchers

What's more, in the wake of Netscape Communications Corp.'s wildly successful initial public offering, stock price — especially in the Internet arena — is fast becoming a key measure of a company's stability and viability regardless of the stock value'a relationship to actual revenue.

Since complaints made to the U.S. Department of Justice tend to receive media coverage, observers last week predicted that Microsoft's image as an industry bully, deserved or not, fueled by the ongoing probes, could potentially drive down the company's stock price.

While Microsoft's stock has proved to be a steady performer over the past decade, any significant downturn could be perceived by users and analysts as a decline in the Redmond, Wash., company's dominance.

"Stock valuation has become a competitive weapon in trying to control the Internet," said Charles Wolf, vice president of equity research at CS First Boston, an investment banking firm in New York. "A high stock valuation allows companies to acquire other companies and technology using the currency of inflated share prices."

The impact on Microsoft's stock may be speculative, but continued probing by the Justice Department is unlikely to let up.

"Microsoft has a real struggle on their hands," said one financial analyst, who asked not to be named. "They have generated so much ill will in the industry that there is bound to be a backlash from competitors. Most of them probably already have the [Justice Department's] number on speed dial."

COMPUTERWORLD ANALYSIS: DOJ probe

The most recent case of government probing was in response to complaints by Internet browser vendors that installation of Microsoft's browser disables theirs (see story at left).

Last week, officials for Internet competitors said only that their communication with the Justice Department is ongoing. One official, who requested anonymity, confirmed that his company has been in touch with the agency over the browser issue.

However, even some staunch Microsoft foes don't expect any action from the most recent investigation.

"I don't think we're up against something that's imminent, but I think the [Justice Department] will continue to investigate [Microsoft's business practices] seriously," said Gary Reback, a partner at the law firm of Wilson Sonsini Goodrich & Rosati In Palo Alto, Calif. He led an effort by three anonymous clients to push the Justice Department into blocking Microsoft's proposed acquisition of Intuit Corp. last spring.

In fact, it is possible that The Microsoft Network (MSN) investigation stalled because the two leading competitors — America Online and CompuServe — both claim to have continued to grow at unprecedented rates since MSN became available.

The Japanese are turning to Windows 95. See page 54.

Web watchers see field widen

By Kim S. Nash

A spanking new Internet software company entered the fray last week, using the Web Innovation show in San Francisco as a launch pad.

Iband, Inc. in Campbell, Calif., unveiled Backstage, a line of graphical tools for building World Wide Web applications that can be linked to corporate relational databases.

The products, which are set to ship next month, are targeted at information systems managers who create internal Internet, or intranet, programs.

Other announcements at Web Innovation include the following:

- **Sun Microsystems, Inc.** and **Netscape Communications Corp.** unveiled JavaScript, a simpler, more graphical version of Java "for normal people rather than hard-core programmers," according to a Netscape marketing executive [CW, Dec. 4].

JavaScript is in testing now on a beta version of Netscape's Navigator 2.0 browser. It is slated to ship next month.

- **Sun** and **Silicon Graphics, Inc.** (SGI) pledged to integrate their Web development tnols. It is the first joint development project for the Unix rivals. Developers using Suo'a Java programming language early next year will be able to create applications that support SGI's Virtual Reality Modeling Language for creating three-dimensional graphics.
- **Illustra Information Technologies, Inc.** in Oakland, Calif., unveiled an add-on module to its object-oriented namesake database. Web DataBlade was designed to let users create documents in Hypertext Markup Language, the mother tongue of the Web, and store them in the Illustra database. End users can query the documents via Web broswers. Pricing for the module starts at $395 for a single-user developer's license.

High-tech roundup on Capitol Hill

By Gary H. Anthes

The battle over on-line pornography, which had been tilting toward free speech and free-market forces, veered sharply in the other direction last week.

An Internet porno ban is now likely to become law as part of the huge telecommunications reform package pending in Congress.

A House committee kept in a Senate bill most of the provisions that would impose fines and prison sentences on those who knowingly transmit pornography viewed by children on the Internet.

"There is no way [Internet service providers] can filter and investigate everything they are passing on," said Raymond H. Hoving, vice president for issues advocacy at the Society for Information Management. "This will put some of them out of business for liability reasons and hurt the ability to have electronic commerce."

*****

In another blow to free-market forces, the White House said it won't relax controls on the export of encryption products that would prevent the government from unscrambling coded communications in court-approved wiretaps. Michael Nelson, the Clinton administration's point man on the controversial "key-escrow" encryption program, said the export controls "continue to be valuable."

The Business Software Alliance condemned the policy as one that "continues to erode U.S. software companies' international competitiveness."

At a public meeting at the National Institute of Standards and Technology, Nelson unveiled draft criteria for government-certified encryption key-escrow agents. They did not address conditions under which corporations might be their own escrow agents, something industry has been demanding.

The criteria are posted at bttp://src.ncsl.nist.gov/keyescrow/.

****

Silicon Valley also won one on Capitol Hill last week. The Senate and House passed a measure that would make it much harder for shareholders to file "abusive" and "frivolous" lawsuits against companies they claim have misled them.

High-tech firms, whose often volatile earnings have invited many such lawsuits, lobbied hard for the legislation.

President Clinton bas yet to sign the measure into law, but sources said he can kiss his already shaky Silicon Valley support good-bye if he vetos the bill.

****

The U.S. Patent and Trademark Office said last week it will bold a public meeting this Friday to seek comments on its programs for information dissemination. In September the agency announced it would put 20 years of patent information in a fully searchable database on a World Wide Web server. The patent office now distributes information on CD-ROM and through a bulletin board service. Users outside the Beltway can visit the site at bttp://www.uspto.gov.

****

Meanwhile, the Internal Revenue Service said last week it will expand its pilot tax file-by-telephone program nationwide next year. Some 23 million filers now using the paper 1040EZ form will be able to use a Touch-Tone telephone instead.

Greatly reducing paper is essential if the IRS is to meet the goals of its multibillion-dollar systems modernization plan.

Recently, however, the U.S. General Accounting Office warned that if electronic filing continues to grow at its current rate, the IRS will fall short of its goal of receiving 80 million returns electronically by 2001.

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Soft Mac software sales are deceiving

By Lisa Picarille

Not surprisingly, sales of Windows applications in almost every product category went through the roof in the third quarter, according to the Software Publishers Association's quarterly software sales report.

At the same time, sales in most Macintosh software categories plummeted.

But don't let the numbers fool you. Despite the very noticeable decline in sales of software for Apple Computer, Inc.'s Macintosh, the Macintosh market is thriving, according to industry watchers.

The report from the industry association based in Washington, showed that revenue for Macintosh software dropped 26.3% to $242.5 million for the third quarter of 1995, compared with $329.3 million for the same period last year.

At first glance, this dramatic drop appears to be in direct conflict with published reports from market research firms such as Dataquest, Inc. and International Data Corp. Those reports ranked Apple as the No. 1 seller of desktop computers for the quarter.

And since Apple did indeed sell a record number of units for the quarter — more than 1.25 million — why didn't Macintosh software sales also rise?

One explanation is that Apple's revenue for the third quarter of the calendar year — which is actually its fiscal fourth quarter — is traditionally boosted by hefty sales in the education market. And because those educational Macintoshes come bundled with a variety of software, schools don't need to purchase many additional applicatioos.

Also during the quarter, Apple added several oew models to its Performa line of consumer machines. Those systems, which target home and novice users, come bundled with ClarisWorks, an integrated software package that includes productivity software to cover s oew user's basic needs, said Chris Le Tocq, s Dataquest analyst in San Jose, Calif.

Use of this integrated software bundle coincides with the sharp downturn in sales oI stand-alone productivity packages such as word processors, spreadsheets, databases and graphics packages.

Another explanation for the seeming drop in sales is that the third quarter of 1994 was a blockbuster quarter for Macintosh business software sales.

That was because Microsoft Corp., the leading provider in this market, released the long-awaited native Power Macintosh versions of its best-selling Word and Excel programs.

Bigger windows

North American software revenue for third-quarter 1995

Product category	Windows	Percent change*	Macintosh	Percent change*
Word processors	$375.8M	85.7%	$16.2M	–61.8%
Spreadsheets	$322.6M	99.1%	$11.9M	–68%
Databases	$108.6M	53.6%	$6.2M	–41.5%
Personal information management systems	$76.7M	193.1%	$5.7M	101.5%
Project management	$49.4M	41.8%	$5M	65.8%
Desktop publishing	$34M	22.3%	$31.8M	140.2%

*From same quarter last year

Source: Software Publishers Association, Washington

Windows zips along

Predictably, sales of Windows applications for the third quarter were up across the board. Sales hit $186 billion, an 89% increase over the same quarter last year.

Strong growth in the categories of word processing, entertainment and home education pushed sales up (see chart).

Conversely, sales of DOS applications continued their steep decline, falling 54% to $122 million for the third quarter compared with $266.2 million for the third quarter last year. DOS product sales are just half those of Macintosh application sales, which totaled $242.5 million. — *Lisa Picarille*

'net catches all at expo

Relational DBMS vendors introduce Web browsers, links

By Dan Richman
NEW YORK

A bevy of leading relational database vendors hopped onto the Internet bandwagon at DB/Expo '95 here with browsers blazing last week

Sybase, Inc., Informix Software, Inc., Computer Associates International, Inc. and IBM all announced software that makes relational data accessible from World Wide Web browsers.

Users concurred that such products could change the nature of the Ioternet, which today offers broad but shallow information oo many topics. With links to relatiooal databases, the data available on the Internet can become broad and deep.

"Browser access to relational data will be of increasing importance to us as we make more and more information available to our employees via [the company] intranet," said Duane A. Tucker, a software engineer at services provider Science Applications Internatiooal Corp. in Columbia, Md.

David Macfarlane, Web manager at securities broker Salomon Brothers, Inc in New York, said using Web browsers will cut by up to 30% the time and effort used to develop applications that run on multiple platforms.

Added Peter Digovich, chairman of Corretti Soft, Inc. in Mountain View, Calif., "There's no question that offering Web access to relational data is critical to the success of my business."

His company will unveil an Internet service offering in February for confirming hotel and airline reservations in real time. The confirmation process will require interaction with a relational database management system.

Digovich said he will use DB2 World Wide Web Connection from IBM, one of the four products announced last week. Available immediately and free of charge, it lets users access DB2 data on any supported platform. Other announcements iocluded the following:

- Sybase in Emeryville, Calif., said it will ship its Internet link, called web.sql, by April 1 for Solaris and by July 1 for all other supported platforms. Prices range from $1,200 for Windows NT to $5,000 for other platforms, depending on the size and number of processors. Web.sql includes Sybase's Open Client, which lets browsers access oon-Sybase data.
- The Web Interface Kit from Informix Software in Menlo Park, Calif., available immediately at no charge, lets users create or modify applications in Informix-4GL or Informix-ESQL for use on the Web.
- CA-Ingres/Internet Commerce Enabled (ICE) from CA in Islandia, N.Y., does more than make Ingres data available to Web browsers, the vendor said. It was designed for use on Hypertext Transport Protocol (HTTP) proxy servers, which link s database to users of an intranet, an internal company Internet (see story below). Last week's annouocements come about two months after Oracle Corp. announced its WebServer Option, which lets the Oracle7 Enterprise Server RDBMS be used as an HTTP server. It is available on all platforms for $4,995.

Oracle gives users central database control. See page 71.

CA unveils Internet security software

By Thomas Hoffman
and Gary H. Anthes
NEW YORK

Computer Associates has introduced Unicenter/ICE, s new version of its systems management software to help users secure and manage their Internet setups.

To make sure it reaches the right sudience, CA will integrate its Uniceoter/ICE software with Netscape Communications Corp.'s Netscape Commerce Server. CA also plans to link Unicenter/ICE with other Web server software to let cybersurfers manage electronic commerce and other functions over the Internet.

CA plans to ship Unicenter/ICE in the first quarter of next year at 15% of the base price of existing Unicenter server software. Unicenter/ICE will ship for all major versions of Unix and Windows NT, according to Charles B. Wang, CA's chairman and CEO.

CA's actioos represent the first effort by s major vendor to address the critical security and systems management requirements of Internet and intranet-related traffic, according to analysts.

"Everyone is setting up Web servers, but no attention is paid to things like, 'How do I know when my disks are getting full?' and 'Are my disks getting backed up?'" said John Pescatore, research director for information security at IDC Government in Falls Cburch, Va. CA is integrating Legent Corp.'s AgentWorks intelligent agent software into Unicenter/ICE so network administrators can track unauthorized Internet activities within their organizations. That ability could, for example, identify employees who are caught surfing *Playboy*'s home page on company time, said Barbara Sannerud, vice president of product strategy at CA.

CA's Unicenter/ICE *helps users secure and manage tasks over the Internet*

Those surveillance capabilities appeal to Gary Gould, director of MIS at Minolta Corp. in Ramsey, N.J. "The Internet can be s lot of help to companies, but it's s medium that's ripe for internal sbuse."

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AS/400, RS/6000 to share PowerPC chip

IBM may pass along lower systems costs to users; platforms keep own software

By Jean S. Bozman and Craig Stedman

IBM plans to use 64-bit PowerPC chips under development for the AS/400 in future models of its RS/6000 Unix servers. The move is part of a wider strategy to cut development costs by sharing components between the two systems.

Irving Wladawsky-Berger, who was general manager at IBM's RS/6000 division until Dec. 1, said the plan also stems from development delays on the promised 64-bit PowerPC 620 chip, which is intended for RS/6000s. "It very well may be that the [next AS/400 chip] will be available before the 620 could be, especially for large servers," he said. Wladawsky-Berger now heads IBM's Internet division.

IBM is expected to pass along some of the savings to users through lower prices on AS/400s and RS/6000s. Company sources said the merged platform will take shape during the next two years and also will include common memory subsystems, power supplies and I/O controllers.

IBM's Irving Wladawsky-Berger: *The next AS/400 chip may be available before the PowerPC 620*

The AS/400's PowerPC AS chip, a superset of the PowerPC architecture, won't be plugged in to the RS/6000 until 1997. Second-generation chips that would let AS/400-specific storage and memory-locking instructions be disabled are supposed to be ready by then.

IBM intends to keep separate software environments for the AS/400 and RS/6000, so users won't have to change their operating systems or applications to use the common architecture. "Neither system goes away," said David Andrews, a consultant at D. H. Andrews Group, Inc. in Cheshire, Conn.

More is better

IBM has to ensure that its AIX variant of Unix can run without any hitches on the PowerPC AS, said Roy Dodd, MIS director at The Good Guys in Brisbane, Calif.

"I really don't care which chip they use as long as I get more throughput," he said. "But if the different chip affected the operating system release level, then that might be a concern to me."

The PowerPC AS would provide a 64-bit upgrade path for RS/6000 users starving for better performance. Dodd and others have complained that they can't get enough power out of the original crop of PowerPC 601 chips and they're still awaiting a 604 chip upgrade that was due in mid-1995.

The PowerPC 620 is also running late. Its shipment was pushed back from this year to 1996, and some analysts said the PowerPC AS may elbow the 620 out of the way altogether. However, IBM officials said work on the 620 continues.

Commercial shops running database applications would benefit more from a 64-bit RS/6000 than technical users, said David Truch, site performance manager at BP America, Inc.'s Cleveland-area information technology operation.

"If you rehost a mainframe application, you need something that can handle that type of transaction process, and a powerful machine would help," he said.

The AS/400 begins its second life as a RISC system. See page 74.

"Typically, when we had an important event coming up, we would rely on a mailing to our own database as the prime vehicle for getting the information to the people we had targeted.

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IBM to integrate Flowmark, Notes

By Tim Ouellette

IBM is taking baby steps to keep pace with other workflow market leaders.

The computer giant last week announced Version 2.2 of Flowmark, an upgrade that aims to clear up some of the confusion surrounding Flowmark's relationship with Notes groupware from subsidiary Lotus Development Corp. and IBM's ImagePlus imaging software.

Workflow software automates and tracks the movement of work items around a company and lets users measure the productivity of the work process.

IBM for the first time clearly stated its plans to move Flowmark beyond just AIX Unix on the server.

The product will move to Hewlett-Packard Co.'s HP-UX and Microsoft Corp.'s Windows NT. Client support will extend beyond OS/2 to include Windows 95 and Windows NT.

Flowmark 2.2 will integrate with Notes through a Service Manager Broker, much like a similar imaging-to-Notes connection announced recently [CW, Nov. 6]. The upgrade will be available in February.

From Flowmark, users will be able to start up Notes and search, create, read and update Notes documents. At the same time, Notes users can start or stop a Flowmark workflow process.

Utah Retirement Systems in Salt Lake City is in the pilot phase of a Flowmark installation that will integrate with applications such as imaging and Notes. That integration will help automate all retirement claims processing at the state agency, said imaging support analyst Randy Heyborne.

Competitors FileNet Corp. and Wang Laboratories, Inc. already have workflow integration plans with groupware products from Novell, Inc. and Microsoft respectively. And while Flowmark 2.2 offers a customizable work list interface based on a new industry specification, analysts said most vendors already offer their own customizable interface. The current version of Flowmark doesn't have the interface, however.

IBM on the mark?

- Supports workflows across multiple servers
- Handles more users and work items by moving some of the processing from the server to the client
- Offers APIs for users to build links to other business applications
- Maintains link between Flowmark and a related application so users don't have to keep opening and closing the application
- Plans for future versions will integrate with IBM's business modeling software so models can automatically start Flowmark work processes

Links and hooks

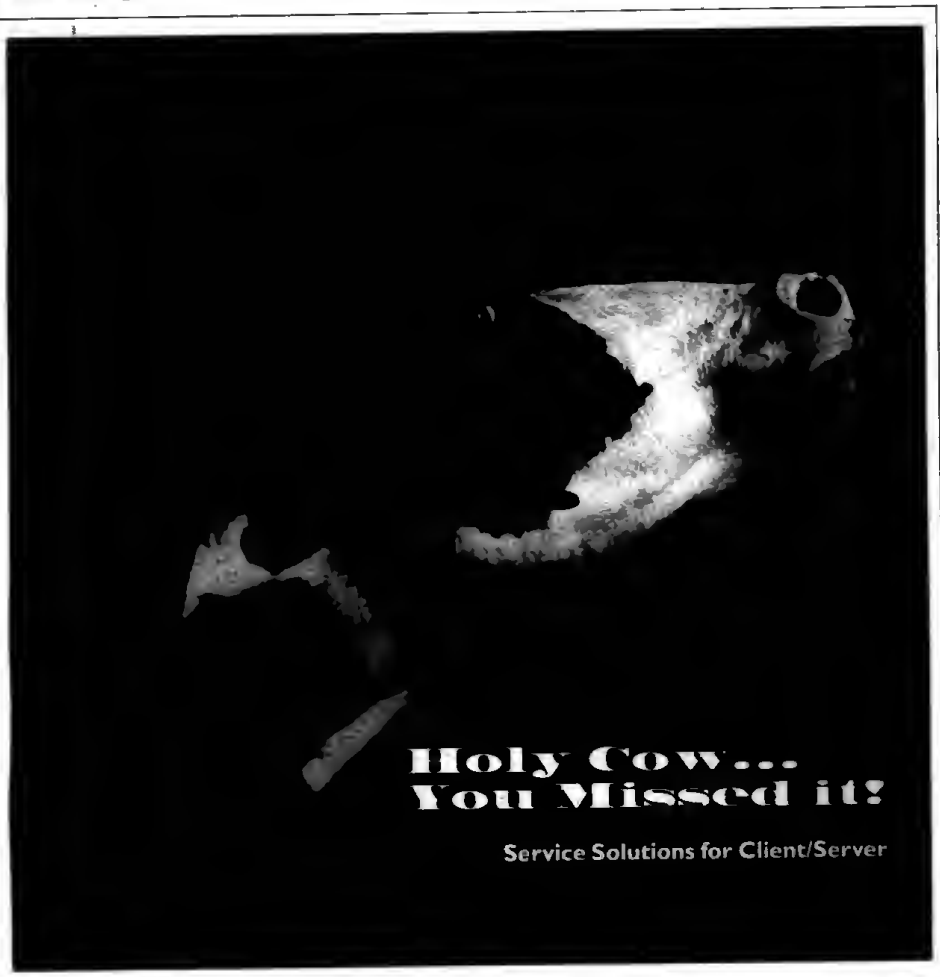
Flowmark will ship with links to Notes and IBM's ImagePlus VisualInfo client/server imaging software, although a link to IBM's large base of ImagePlus AS/400 installations isn't ready yet.

Heyborne said a systems integrator has been working to develop homegrown hooks to Flowmark from the agency's ImagePlus AS/400 imaging system. But Heyborne said he expects that linking Flowmark to the MVS mainframe database of employee information will be easier.

Analysts said the move toward other computing platforms is a good first step, but IBM still has a long way to go to convince users outside of IBM shops of the benefits of its workgroup strategy.

"IBM had the political will to kill all their workgroup stuff and say Notes is their workgroup offering," said Scott McCready, an analyst at International Data Corp. in Framingham, Mass.

"Now they have to show how the products are used at their best when used collectively," he said.



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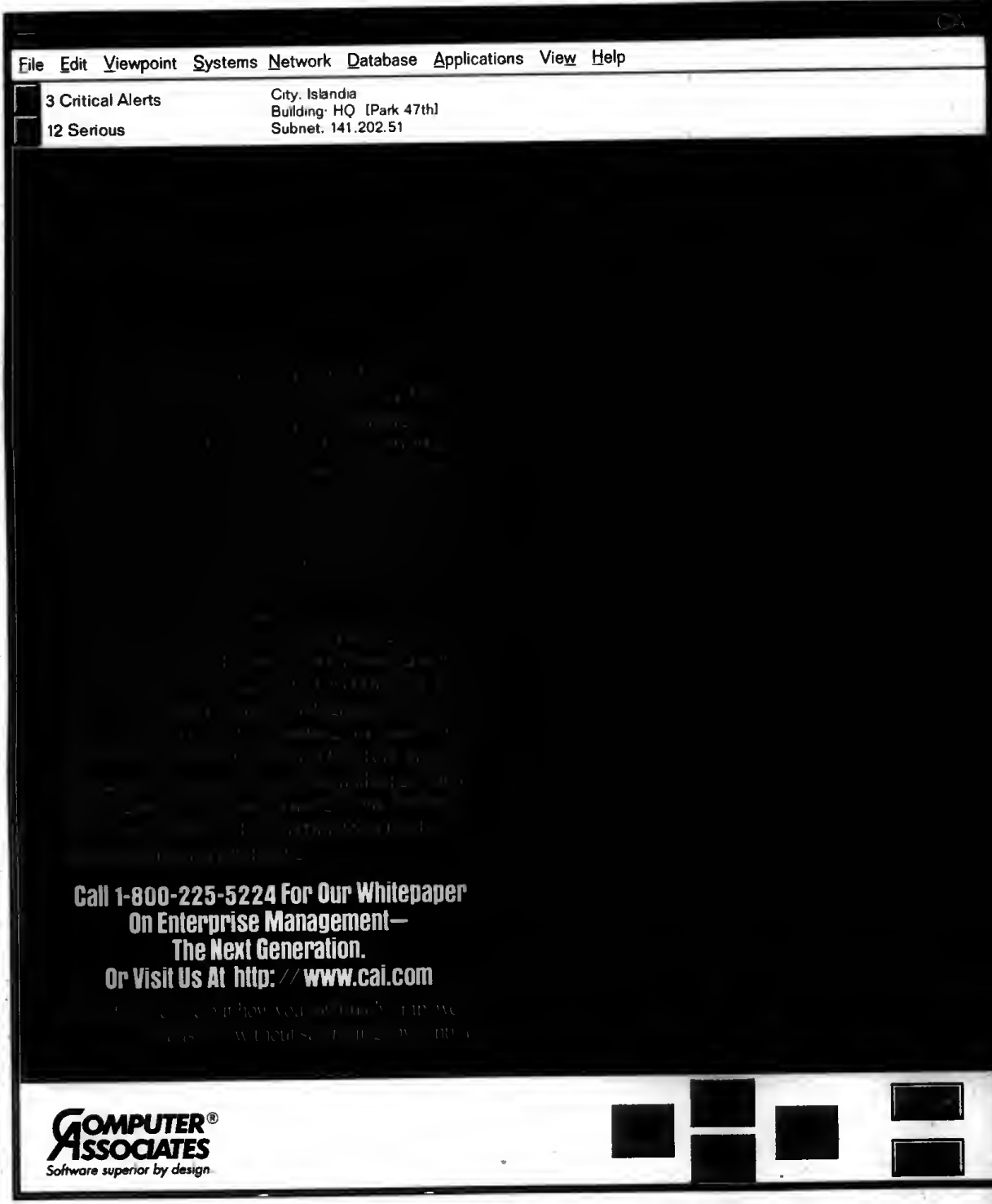

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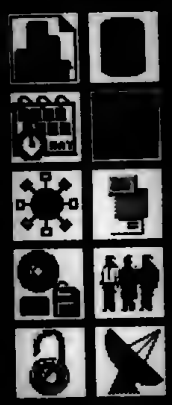

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Fibre Channel specification proposed

By Bob Francis

A Fibre Channel interconnect specification proposed recently by Compaq Computer Corp. and Sun Microsystems, Inc. will fire up those companies' plans to assault the glass house with high-end servers.

This proposal is the first time Houston-based Compaq and Sun, in Mountain View, Calif., have indicated the role Fibre Channel will play in their server plans. Disk drives with Fibre Channel connections have just begun to ship from Seagate Technology, Inc., and storage arrays with Fibre Channel connections are expected in the first half of next year, industry officials said.

Compaq will most likely use the interconnect specification, designed along with AMP, Inc. in Harrisburg, Pa., and Western Digital Corp. in Irvine, Calif., for storage applications involving large application servers and clustered systems, said Mike Perez, vice president of the systems division at Compaq.

Data transfer

The connector offers data transfer rates of up to 100M byte/sec., hot-pluggability and the ability to add storage without taking the server off-line, said Jeff Vogel, a product manager at Western Digital.

One analyst said the technology is key to Compaq's long-held ambition to crack the market that has typically bought mainframes.

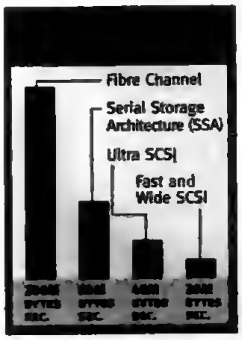
"To offer the sort of fault tolerance of these high-end systems like Tandem and Sequent, Compaq has to have a reliable high-speed backup and storage system," said Farid Neema, an analyst at Strategic Research Corp. in Santa Barbara, Calif. "If you just used SCSI, it would be fast enough for these large database applications."

Long way to go

But users said these systems still have a long way to go before they offer the same reliability and scalability of high-end Unix systems.

"These companies, like Compaq, are on the right track, but it takes a while to build all these features in," said Mike Prince, manager at Burlington Coat Factory, Inc. in Lebanon, N.H.

Fibre Channel initially offers a data transfer rate of 100M byte/sec., which will increase over time. It also offers the ability to connect to systems up to 30 meters away using copper wire, and up to 10 kilometers away using fiber optics, for wide-area networks and remote backup and recovery server applications.



Western Digital's implementation of the connector is shipping in sample quantities, and the company expects to begin full shipments in the first quarter of 1996, Vogel said.

The specification should also lower the cost and increase the effectiveness of systems that use it, Compaq officials said. Previously, each vendor either had to offer a proprietary connector, which would increase the systems' cost, or use a slower SCSI connector, which would limit the useful applications of clustered systems.

Compaq plans to use the Fibre Channel connector on the four-server clusters it intends to offer next year, Perez said.

The plans center on clustered servers supporting both Unix and Microsoft Corp.'s Windows NT operating systems. Compaq plans to capture pieces of both the high-end Unix server and low-end mainframe application markets using this clustered model, analysts said.

Sun, too, has been making headway, though at the higher end of the client/server market. The company was one of the first to use Fibre Channel in its storage systems, which has given it a competitive edge in offering high-end application servers, analysts said.

Other vendors, such as IBM, Hewlett-Packard Co. and Digital Equipment Corp., have indicated plans to use Fibre Channel and the new interconnect on systems ranging from PC servers to high-end Unix servers.

PC users await true benefits of symmetrical multiprocessing

By Jaikumar Vijayan

Intel Corp.'s Pentium Pro chip is expected to galvanize the symmetrical multiprocessing (SMP) PC server market. But for most users, the true benefits of SMP will remain more promise than reality.

SMP will boost PC server performance by splitting tasks among processors rather than funneling them to a single chip. But most users are buying SMP only for the future, focusing on systems that allow them to add extra processors and create an upgrade path.

"We have boxes that will allow you to have more than one processor, but we are using them only with one," said Glenn Sandusky, vice president and chief information officer at Aon Speciality Group in Chicago. "You buy [SMP systems] as a sort of insurance policy."

Users and analysts see the following three major stumbling blocks for SMP servers on the PC end:

- Users don't need the horsepower. According to International Data Corp. (IDC) in Framingham, Mass., most PC servers handle print and file-sharing applications. Neither requires the brute force of additional processors.
- The software lags behind the hardware. SMP-capable operating systems and application software are relatively immature.
- Hardware vendors still can't get truly symmetrical performance boosts. So adding four processors doesn't quadruple performance, for example.

Server change

File servers account for 74% of worldwide LAN shipments, according to International Data Corp. But application servers will fuel the growth of the LAN server market through 1998 and beyond.

SMP: Reality check

- Shipments of SMP-enabled PCs are growing, but most users still use them in uniprocessor configurations
- SMP is not likely to be adopted widely for another two years
- SMP boxes are best suited as application servers. By 1998, 43% of network servers will be used as application servers.*

*According to International Data Corp., Framingham, Mass.

Still, sales of SMP-enabled servers have been growing.

"Even when people don't have an immediate need for them, it provides a security blanket just in case you ever do need [an] upgrade," said Tom Kucharvy, president of Summit Strategies, Inc. in Boston.

When PC servers are used for heavy-duty database applicatioos, transaction processing and other mission-critical applications, processor scalabibty will become an issue, industry observers said.

Tire kicking

"We are still pretty much in the tire-kicking stage. You are going to see really serious deployments only io another two years or so," said Ted Julian editor of "The Gray Sheet," an IDC newsletter published in Framingham, Mass.

Vendors cite two good reasons to keep an eye on the SMP market: the Pentium Pro, which is optimized for SMP performance, and the growing popularity of the SMP version of the Windows NT operating system.

Users agree.

"They are ideal for running heavy-duty Windows NT and Microsoft BackOffice applications and for smaller workgroups," said David Greenberg, chief technical officer at Visteon Corp. The company uses SMP servers to provide outsourcing services to the Orlando Healthcare Group in Maitland, Fla.

Similarly, Partners Healthcare Systems, Inc. in Boston is consolidating several Novell, inc. NetWare and Windows NT servers into NT-based SMP servers in two Boston hospitals, said Jim Marra, director of technology planning.

Fore smooths path to ATM with acquisition

By Bob Wallace

Fore Systems, Inc. is looking to smooth the path to ATM by acquiring companies whose products extend the reach of ATM backbone networks, be it to the desktop or, now, to the remote office.

That was the case last week when Fore, the market leader in Asynchronous Transfer Mode (ATM) switches, bought CellAccess Technology, Inc. in Los Gatos, Calif., for an estimated $50 million to $55 million.

CellAccess products, which have been shipping since March, help users save money by aggregating voice, data and video traffic at far-flung sites onto a single high-speed wide-area network.

By aggregating network traffic, CellAccess products help reduce the cost of ATM WANs. Today, ATM networks are used almost exclusively for high-end data applications. Some networks handle video traffic, but few handle voice traffic.

Fore leads the ATM industry in installed users, with more than 800 customers. This year, it began to expand its reach by providing a pathway to ATM.

Buying spree

In May, Fore announced the acquisition of Advanced Network Technology, Inc., an Ethernet and Fast Ethernet switching system vendor, for about $35 million.

That acquisition gave Fore an entry into user accounts with Ethernet LANs. Through CellAccess Technology, analysts said, Fore can snap up another wide base of users: remote sites looking to join corporate ATM networks.

Analysts applauded Fore's CellAccess purchase.

"It sounds like buying CellAccess will be a good fit for Fore because it enables them to expand into the wide-area networking market," said Beth Gage, a broadband consultant at TeleChoice, Inc., a Verona, N.J., consultancy. "This marks an expansion into handling more video and voice traffic."

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[illegible] Report, 10/95

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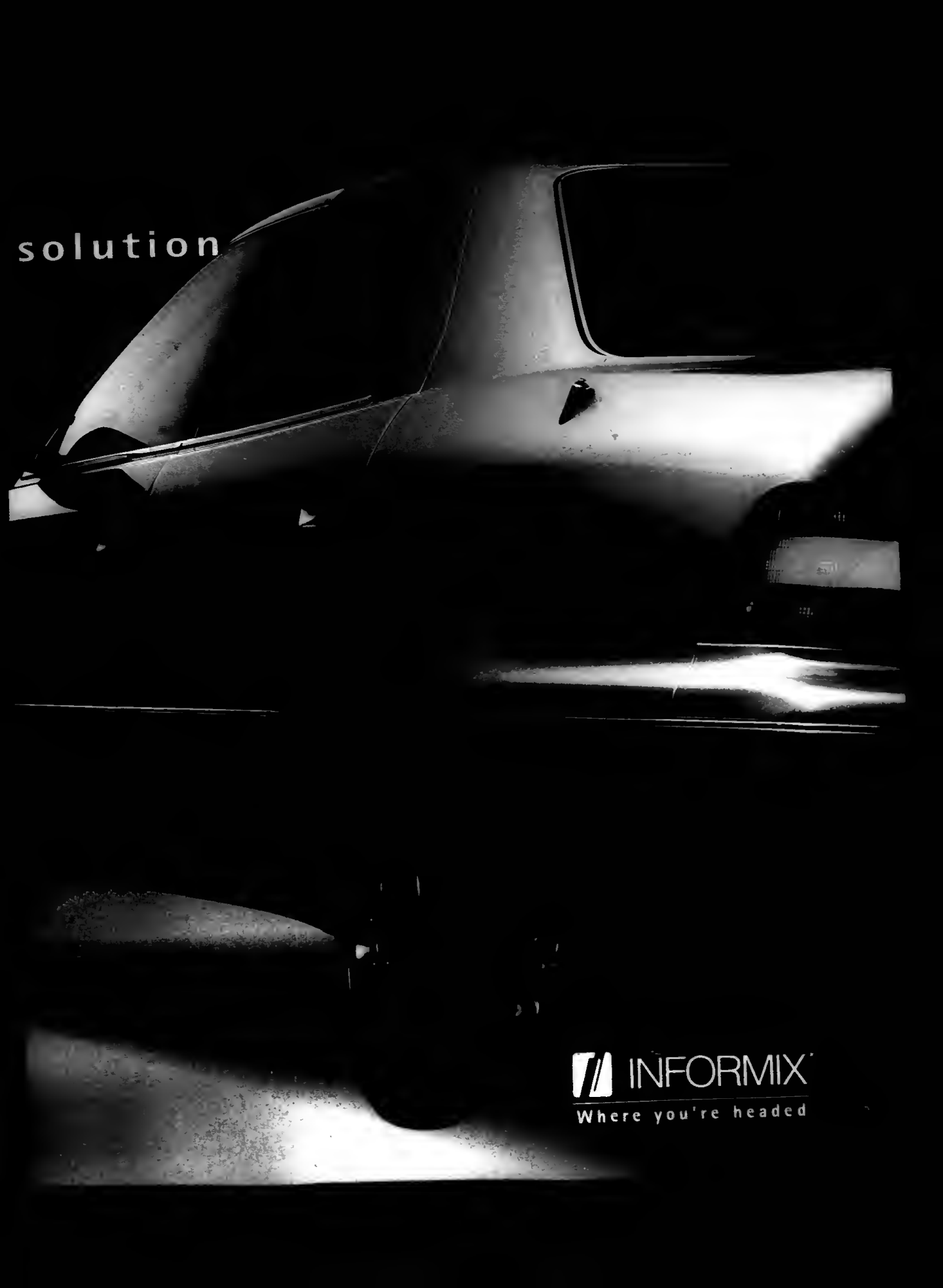
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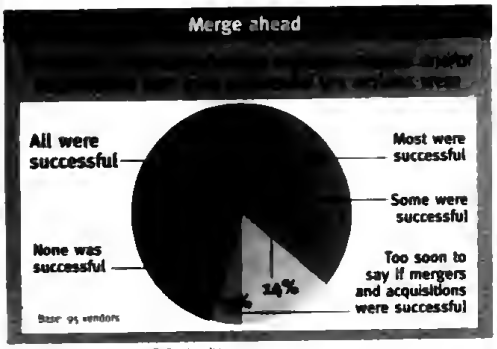


Source: Broadview Associates L.P., Fort Lee, N.J.

Analysts see no end to merger madness

By Tim Ouellette

If you thought 1995 was a big year for mergers and acquisitions in the computer industry, hold on to your hats.

Mergers and acquisitions in the computer industry hit record highs this year, with 684 deals reported in the first six months alone.

And in 1996, a majority of information systems vendors (64%) expect to pursue even more deals, according to a recent survey of computer industry executives.

This may stem from the success of recent deals (see chart) that have provided continuous cash flow, good shareholder value and strategic advantages.

Broadview Associates L.P., a merger and acquisitions advisory firm, surveyed 150 computer executives at companies of various sizes, from less than $25 million in revenue a year to more than $500 million a year. Respondents from software and telecommunications companies showed the most inclination to pursue mergers or acquisitions next year.

This year's spate of nuptials is attributed mostly to the allure of several hot trends: industry's rush to embrace the Internet, deployment of client/server, the convergence of media and technology and faster product cycles, said Charlie Federman, executive committee chairman at Broadview Associates in Fort Lee, N.J.

Federman said he expects the total number of transactions this year to easily surpass 1,000, compared with 760 in 1994. He predicts at least as many deals for 1996. "Time to market has been so incredibly critical," Federman said. "The market is so vibrant that unless you are there [already, the fear is] you are toast."

The action is not limited to the leading players in the market. "It is a strategy they are taking whether they are Microsoft or a start-up company," said Larry Buchsbaum, manager at Coopers & Lybrand's National High Technology Group in Boston.

Acquisitions

But even with the high level of mergers in the software arena, "you are not seeing a contraction in small companies starting up. There are a lot of developers out there finding niches," Buchsbaum said.

Novell, Inc., which is in the process of selling off its applications business, is seemingly bucking the buying trend. But that isn't necessarily the case.

"What Novell is doing is not that unusual," Federman said, noting that historically, about 30% of all computer industry transactions have been divestitures by one company.

The Wall Street boom in technology shares now makes stock the currency of choice for these mergers and acquisitions. Before, the focus was on cash. Stock transactions or a mix of stocks and cash, are expected to make up 62% of all deals in the coming year.

For example, Wang Laboratories, Inc. just bought Avail Systems, Inc. for 1.8 million shares of its common stock (see story above right).

Wang beefs up imaging

Company boosts its stable of products with Avail software

By Tim Ouellette and Bob Francis

Wang Laboratories, Inc. has opened its wallet again to add to its workflow and imaging software offerings.

This time, the Billerica, Mass., company added storage to its repertoire by purchasing Avail Systems, Inc. for $32 million.

More important, with Avail's LAN storage software comes the Boulder, Colo., firm's development pact with Microsoft Corp.

Microsoft licensed Avail's pending storage management patents for inclusion in future versions of the Windows NT operating system and is jointly developing a storage management component for a networking product suite.

Combining Wang technology with Avail's hierarchical storage management, which will be integrated with NT, means large image files can be stored in multiple tiers of optical, tape and disk storage and accessed transparently, said Gerry Murray, an analyst at International Data Corp.

This, combined with Wang's development of a free image viewer that will become a feature of Windows 95, ensures that Wang's products will be consistent with Microsoft software.

Nice move

"It's a nice move by Wang and will give the average user the ability to use images without having to go to separate image files," Murray said. Usually, imaging systems include a proprietary layer to improve the input and output of image files.

"It lets us take a strategic lead in the hierarchical storage management space and is a natural fit" to provide full image, workflow, document management and storage to users, said Robert Weiler, vice president of Wang's software operations.

The deal may also mean lower prices for imaging because information systems managers attempting to set up image systems won't have to maintain separate image servers and storage requiring separate administrators.

Avail also has a strategic partnership with IBM's Storage System Division, which links Avail's NetSpace storage management software with IBM's ADSM storage vaulting and enterprise backup software for mainframe and minicomputer systems.

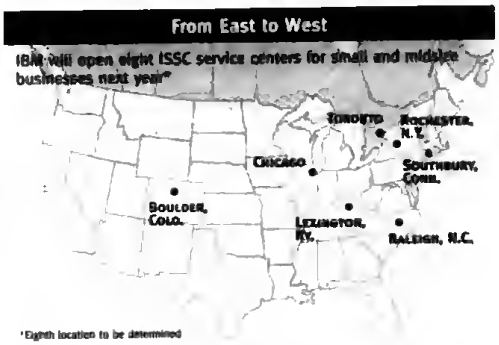
IBM's ISSC targets smaller firms

PC management fuels outsourcing

By Mitch Wagner

IBM's services arm on Wednesday announced a new business unit devoted to serving small and midsize businesses.

Integrated Systems Solutions Corp. (ISSC) in Syracuse, N.Y., said the Midrange Services business unit will target its consulting and outsourcing offerings at companies with roughly $100 million in revenue or less and up to about 1,000 employees.



Interest high

ISSC sees greater interest in outsourcing on the part of small business, fueled by a desire to control the costs of PC management, according to Kathy Dodsworth-Rugani, program director at the Midrange Services unit. "The whole move to network-centric computing and the Internet has got a lot of people saying, 'What's the best way to use technology to improve business posture?' " Dodsworth-Rugani said.

ISSC estimates that small and midsize businesses accounted for 33%, or $19 billion, of information technology services expenditures in the U.S. this year. It predicts that figure will grow 15% annually through 1998.

"This is an area where they haven't penetrated up until now, and there's a vast market opportunity," said Berge Ayvazian, an analyst at The Yankee Group. IBM will face stiff competition from consulting units associated with regional phone companies and from small, neighborhood outsourcers. It is a market that IBM has had some difficulty understanding, at least at first, said Eric Roll, vice president of information technologies at Inchcape Shipping Services, Inc. in Mobile, Ala.

Inchcape provides back-office services for shipping lines and was part of the pilot project for Midrange Services. As a cost-saving measure, it turned over its information systems operation, with the exception of systems development, to ISSC in December 1994.

ISSC at first had a hard time maintaining close communication with Inchcape. Analysts and users said ISSC will find that small users need more communication and proportionally more of an on-site presence than large customers. They said ISSC also will find that smaller customers don't face the same mainframe maintenance issues or the need to migrate from mainframes to client/server technology that big companies do. That is because most small companies never had mainframes.

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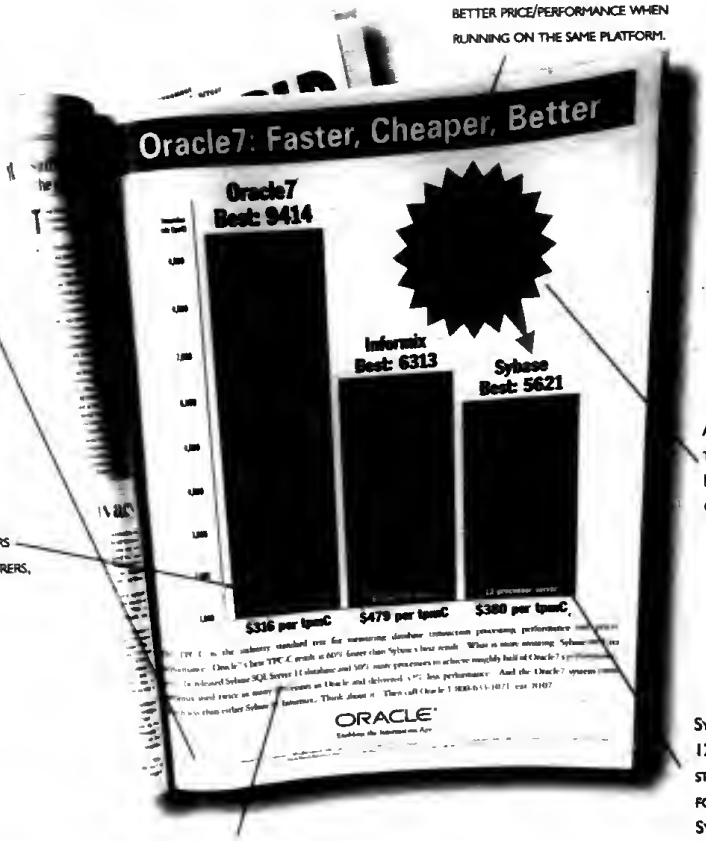

Actually, Sybase is faster than both Oracle and Informix when compared on the same platform.

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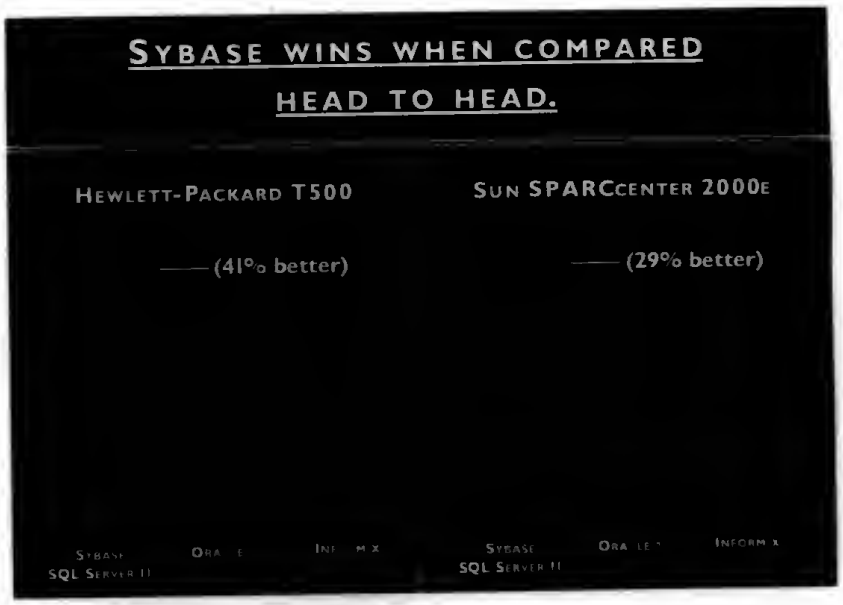

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Hot Java!

Microsoft's Internet attack plan came more or less into focus last week when it made some pragmatic moves that acknowledge Sun's Java programming language as a force to be reckoned with.

But whether or not Microsoft ends up licensing Java outright or offering support for the language in its own browsers isn't relevant to thia column, and it isn't as relevant as you might think to the overall direction of the computer industry. That'a because the Java train has pulled out of the station and is barreling along the tracks with so much momentum that even Microsoft could get squished if it gets in the way. It's a much better idea to try to hop aboard, no? (For more on Java, see page 142.)

Just like that, the unshakable dominance Microsoft has had over setting the course of the computer world is moot. It really is moot because it won't exist.

What Java will apparently spring upon the world is a machine-independent language and, by association, machine-independent applications. This was the dream that always lingered in the back of the mind of members of the Open Software Foundation.

The OSF, like the burgeoning junta of Java endorsers, had several big and powerful constituents such as IBM, Digital and Hewlett-Packard. But it didn't have the Internet, that protocol-rich marvel that defies domination by any big shot.

Now combine the Internet's unbelievable data transport capabilities with a Sun-led consortium comprising many of Microsoft's most ardent foes, and you have the real possibility of a dream come true. That dream is a wealth of applications written in an open environment that will run on any machine or device.

Does this mean the Suns and Novells and IBMa can start singing a chorus of "Ding-dong the witch is dead"? Not hardly. The beginning of the end of Microsoft's dominance in the industry is far from the beginning of the end of Microsoft. The company remains a true wonder of the business world. It has provided value and real solutions to more users than any other company. It is run by an extraordinarily intelligent team whose competitive energies are second to none. And Windows NT is the most promising technology on the corporate server horizon.

But Bill Gates and Microsoft are looking today at a far different world than they were just a few short months ago.

Bill Laberis

Bill Laberis, *Editor in Chief*
Internet: *bill_laberis@cw.com*

Sleeping sound with tight security

Your story on new tools for hackers ["Underground tools aid fledgling backers," CW, Nov. 13] states that these tools are "enough to keep an IS manager awake at night."

However, your statistics clearly show that not enough IS managers are being kept awake. How else can it be that 85% of users aren't forced to change passwords frequently and 21% of systems require no passwords? If more IS managers were at all worried about security, the figures wouldn't be so high.

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SNA Server key part of BackOffice

Apropos of "Microsoft slowly gaining IS respect in the enterprise" [CW, Nov. 13], it is interesting that a key element of Microsoft's enterprise strategy is seldom mentioned: the SNA Server product in BackOffice. It is key because much information in most major corporations is available only through an SNA network and because PC-based systems, in many cases, aren't up to replacing the old iron just yet. The PC bigots don't like to admit the need for such a product, and IS sees it as a threat. But while the product isn't politically pure for either computing paradigm, it helps both camps.

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shillock@ee.pdx.edu

There's a need for dumb Web terminals

Nathan Myhrvold has either never heard of an X terminal or doesn't comprehend how one functions ["A dumb terminal is just a dumb idea," CW, Nov. 13]. He also doesn't seem to grasp the benefits of X terminals over PCs in cost of both acquisition and ownership.

A diskless device such as an X terminal can be produced for less than a PC because it executes only the presentation layer and not the application logic of the Web browser. All software updates are handled at the server. Even if Microsoft were to ignore the open standard of the X Window System, as it has done with other open standards in the past, the architecture is sound and makes sense for many applications.

Cory Janick
Manager of systems programming
Paychex, Inc.
CVJanick@aol.com

I couldn't disagree more with Nathan Myhrvold's response to an idea about a dumb Web terminal. He probably doesn't have two or three kids in schools with tight budgets. The thought that people can dig deeper in their pockets to spend mooey on disk drives, Super VGA monitors and megabytes of memory just so they can access public information isn't realistic.

I suggest that along with a dumb Web browser will come a Web terminal server. This would be a beefy PC that distributes its power to a classroom of 20 kids, each sitting at a keyboard and VGA monitor but sharing the brains of the classroom Web terminal server. After all, while one person reads the latest news from NASA on his Web terminal, the CPU and network connection is idle. It might as well fetch another page for another user.

Pierre Kerr
Ottawa
Pierre.Kerr@ibs-cta.x400.gc.ca

Old solution to a new problem

If there is such a shortage of help ["Good help harder to find," CW, Nov. 13], why not do like the trades and start an apprenticeship?

I am changing careers. When I started in maintenance, I went through a four-year apprenticeship and would do it again to start in the computer field. But when I check the help wanted ads, I see "Only the experienced need apply." When you train someone, you don't have to break bad habits, and you get loyalty from the employee because you took a chance with him.

In the long run, you get your investment back.

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(c) OS/2 (g) Windows
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Michael Gentle

Sci-fi lessons for IS and users

In his famous science fiction epics, novelist Isaac Asimov handled the conflict between humans and robots by hard-wiring the three laws of robotics into the latter's positronic brains. Clear, established rules governed all human/robot interactions, protecting humans from robots.

Applying the laws of robotics to IS brings everything under control

Given the sometimes conflicting relations between users and the IS department, we also could use some clear, established guidelines to govern all user/IS interactions. The three laws of IS follow:

Law Nn. 1: IS can't harm the business, or through inaction let the business come to harm. This one really would get IS off its collective butt and into proactive mode. No more waiting around until Joe User decides it's time to build a data warehouse — a year after the competition has already been there and back. And when a new system is finally implemented, it had better work or the business might be harmed. IS would be expected to anticipate user requirements and be judged by the effect its systems have on the bottom line.

Law No. 2: IS must obey the orders given to it by a user, except where such orders conflict with the first law. Things get even better here. For users, no more battles with an uncooperative IS staff hiding behind technical excuses that can't be proved or disproved. Straight questions must yield straight answers.

For IS, all user requests would be evaluated on purely business grounds, with the first law acting as a control for users who might inadvertently harm the company, as in the following example: Sales director to IS: "I want the new sales force automation system in place within six months." IS reply: "I'm sorry, Dave. That is unrealistic. A failed implementation could impact sales, and I can't allow that."

The second law really would reap benefits when IS can simply refuse to build certain applications until users revisit the underlying business processes to make them more efficient.

Law No. 3: IS must always protect its own existence, except where this would conflict with the first and second laws. The ultimate sanity check. IS would counter any threats to its existence, unless it could be shown that the business stood to gain from its elimination. (Fat chance!)

IS would be guaranteed its rightful place within the organization, exempt from any hatchet jobs by know-it-all, management-by-magazine-article users or vice presidents with hidden agendas.

Asimov's laws

- A robot cannot harm a human, or through inaction let a human come to harm.
- A robot must obey the orders given to it by a human, except where such orders would conflict with the first law.
- A robot must protect its own existence, except where this would conflict with the first two laws.

Entertaining thought

Outsourcing would be dead in its tracks under the third law, because the CIO would have to be convinced that dismantling IS would benefit the business.

With the three laws of IS, everything would be under control. No more having to deal with cranky users who don't know what they really want. No more building systems to support inefficient business processes.

And no more coping with the enlightened user who seeks his 15 minutes of IS fame by trying to deploy a homegrown PC application on the network.

Now who would have thought that being a robot could be such fun?

Gentle is an IS project manager at SmithKline Beecham Pharmaceuticals in Paris. His Internet address is 100727.2071@compuserve.com.

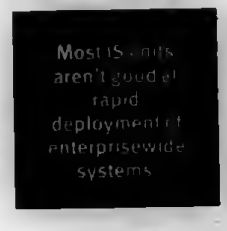
Michael Schrage

Turning success into failure

Success, the saying goes, has a thousand fathers. Failure is an orphan. But who claims paternity when success breeds failures all its own?

A great pilot project can trigger unrealistic demands for a fast rollout

Ironically, some of the best and most innovative information systems shops are finding that success can create as public and as embarrassing a set of problems as failure. In fact, if success isn't skillfully managed, it can utterly destroy the credibility of an IS organization.



Runaway success

So what's the story? Companies that have, for example, a successful Lotus Notes deployment for a far-flung department, or a nifty client/server application in Finance, discover that the rest of the organization clamors to be next. Now!

All of a sudden, that demonstrably effective Notes deployment for 220 is being globally resized to scale up to 2,200. "Oh, and while you're at it, could you support Notes sites at our two key suppliers, too?"

What does IS do? Start training help desks and network administrators like mad? Outsource as fast as it can? Tell the enterprise to "slow down"? Simply accept that the next nine months will be filled with confused expectations, inappropriately designed applications and a mean-time-to-server-crash rate that virtually guarantees a score of 2 a.m. phone calls?

Excuse me, but that's hardly an algorithm for credibility and success. Sure, everybody likes to talk about transition plans for graceful deployment. But the reality is most managers want to plug and play, not wait their turn.

Let's be blunt: Most IS organizations still aren't used to rapid deployment of enterprisewide systems and services.

Tables are turned

After successfully marketing and implementing the innovation within a key part of the enterprise, IS now finds itself caught between struggling to meet impatient demands or begging expectant managers to "be reasonable."

This is a desperately unhappy position.

Instead of success leading to greater credibility and effectiveness, it becomes a club that is used to beat the stuffing out of IS for its inability to deliver the goods for the rest of the enterprise in a timely and cost-effective manner.

Even the best IS departments in the most enlightened organizations find they now have to ask, "What the heck do we do if we're successful?" rather than "What happens if this doesn't work as well as expected?"

Admittedly, that's a healthier question to be asking. However, that is small consolation for an IS organization already stretched to the limit.

IS will be expected to scale up its successes at a deep discount — after all, isn't that what learning curves are all about?

There are tactics that the clever IS organization might consider to make these demands more manageable.

For example, a transition plan might define a finite number of sites to be served in the first nine months. Divisions that want the technology first will have to "bid" for it, with money or assurances that their people will agree to undergo training first.

Indeed, one of the surest ways to dampen the red-hot demand for a new service is to insist that users undergo training before it's deployed. Users have to "qualify" before that Notes site or client/server application is initiated.

You can be sure that "successful" IS organizations will explore all kinds of ways to creatively delay, while qualitatively improving, their enterprisewide rollouts.

Nothing succeeds like success. But in this field, nothing can more rapidly lead to failure, either.

Schrage is a research associate at the MIT Media Lab and author of *No More Teams!* His Internet address is schrage@mit.media.edu.

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- 3 Year Warranty

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- Integrated Audio
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intel inside pentium

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Verbatim

FROM A STATEMENT BY THE IEEE U.S. ACTIVITIES BOARD IN SUPPORT OF A BILL THAT WOULD RESTRICT HIGH-TECH IMMIGRATION:

Contrary to alarms about shortages of technical workers, there are none. For that matter, the shortage predictions that were used to justify the substantial increases in employment-based immigration [in 1990] never materialized.

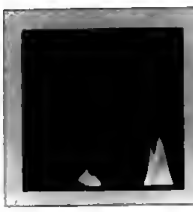
This legislation proposes to balance the legitimate needs of employers and workers. First, under the Simpson bill, employers who wish to hire foreign workers will have to test the domestic labor market for the availability of U.S. workers before they can hire foreign workers.

Second, they will have to pay their foreign workers competitive U.S. wages.

And third, they won't be allowed to replace American workers with foreign nationals who may be willing or have to accept low pay to enter or remain in the U.S.

Great GUI isn't enough

Nancy S. Mueller



Graphical user interfaces are hot, but don't neglect forms, manuals, reports and procedures.

Graphical user interfaces (GUI) are a hot topic in the press today and often are presented as the cure-all for application software usability woes.

In reality, effectively designed user interfaces go far beyond well-designed GUIs. It's time we started focusing on a broader, all-inclusive model for judging usability.

The all-inclusive model takes into account *all* points where a user comes into contact with an input, output, instruction or procedure related to a computer system.

True usability is determined by the extent to which users can carry out system-related tasks quickly and accurately, from filling out forms to interpreting output reports, and not just navigating around in and performing system operations via the application control interface.

Building blocks

Let's look at the five interface components that make up the all-inclusive model:

Application control interface. The application control interface encompasses those aspects of the human-to-computer interface that relate to how an application system communicates with users and lets users communicate with the application system. The application control interface can help users navigate the system and carry out systems operations, such as controlling the order and types of screens viewed and operations performed.

On-line and hard-copy forms interface. Forms play a crucial role in systems. They serve as collection agents for raw data, intermediary agents for entering data and distribution agents for processed data and information.

On-line and hard-copy reports interface. Reports also play a vital role in systems. They provide the information needed to effectively run a business.

On-line and hard-copy user documentation interface. User documentation plays a key role in users' ability to learn and use a system. Types of documentation may include training manuals, tutorials, reference manuals and quick reference aids.

If one piece of the application interface is flawed, users may begin to have problems.

On-line and hard-copy operational policies and procedures interface. Policies and procedures play a major part in users' ability to properly and consistently use an application system to support the business, such as making appropriate data-entry decisions.

When any one of the five user interface components is poorly designed, users may encounter problems.

For instance, some customers may have trouble filling out forms, data-entry clerks may have a hard time entering data and management staff may have difficulties interpreting output reports.

Client/server factor

These problems aren't new, but they are becoming more prevalent and problematic with the recent shift to client/server computing.

The move to client/server computing has resulted in a substantial increase in the number and kinds of designers, applications and users.

So what? Flaws abound in the design of the on-line and hard-copy forms, reports, documentation and operational policies and procedures that surround a computer system.

We rarely think of all of these components as part of an application's user interface. But it has become increasingly apparent that we should.

It hardly matters whether an application has a great GUI if a vice president can't easily and accurately interpret a computer-generated report — you know, the one that supposedly provides mission-critical information for maintaining a competitive edge.

Mueller is director of end-user computing systems and training at Bowling Green State University Graduate College in Bowling Green, Ohio. Her Internet address is nmuelle@pie.bgsu.edu.

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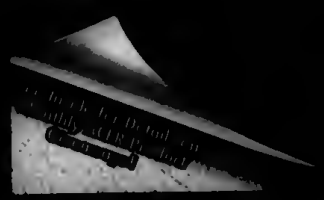

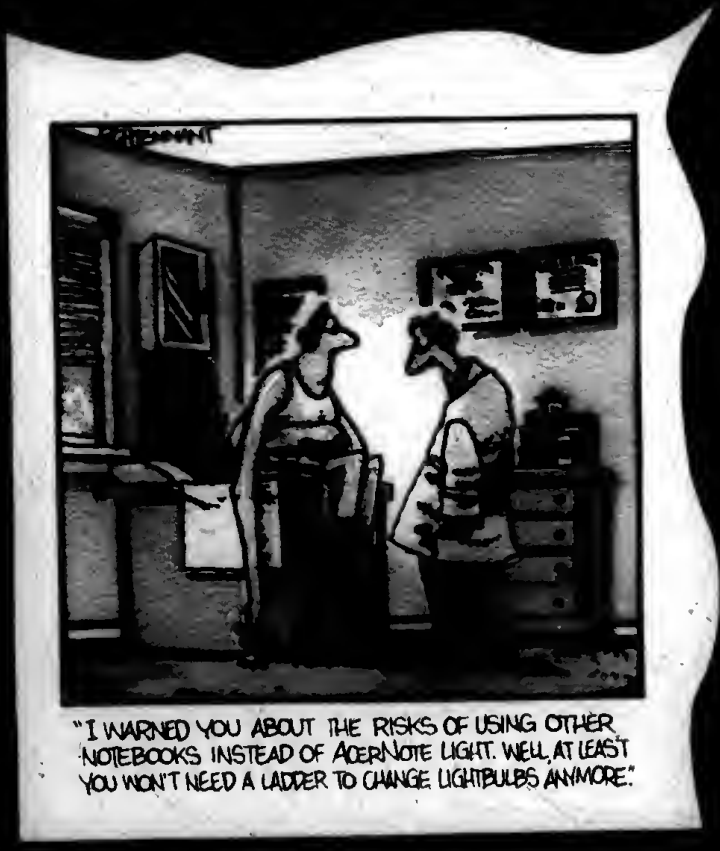

COMPUTERWORLD

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Acer

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"HOW'S THAT FOR FAST SCROLLING?"

December 1995

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February 1996

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Win an Aspire™ Desktop in our *JANUARY* giveaway!

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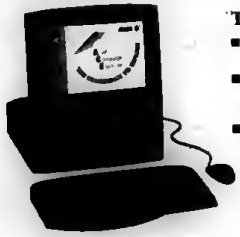

The Aspire Desktop

- 75MHz Intel® Pentium® processor, 850MB HDD, 8MB RAM
- All-in-one multimedia—4X CD-ROM drive, 16-bit sound card, five-channel stereo mixer
- Full communications features, including fax modem, answering machine and voice-mail capability, speakerphone for teleconferencing

Acer

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Asse Milestones... January 1995 Stan Shih and Ronald Chwang inducted into Desktoptops Magazine's Industry Hall of Fame.	1 New Year's Day	2	3	4	5	6
7	8	9	10	11	12	13
14	15 Martin Luther King, Jr. Day	16	17	18	19	20
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January

January 1996

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March 1996

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24 31	25	26	27	28	29	30

Win an AcerNote™ Light in our *FEBRUARY* giveaway!

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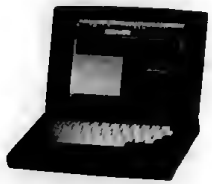

The AcerNote Light

- 75MHz IntelDX4™ processor, 8MB RAM, 420MB HDD
- Dual-scan color display and 3.5" floppy drive
- Type II PCMCIA slot for fax modem and data communications
- Interchangeable floppy drive and battery modules

Acer

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Acer Milestones... **February 1994** *First computer manufacturer to ship Pentium® processor-based desktops in the U.S. retail channel.*				1	2	3
4	5	6	7	8	9	10
11	12 Lincoln's Birthday	13	14 Valentine's Day	15	16	17
18	19 Washington-Lincoln Day	20	21 Ash Wednesday	22 Washington's Birthday	23	24
25	26	27	28	29		**Acer Milestones...** **February 1995** *Acer introduces black multimedia PC for the home.*

[redacted]

February

February 1996

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April 1996

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28	29	30				

Win an AcerPower™ Desktop in our *MARCH* giveaway!

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The AcerPower Desktop

- 75MHz Intel® Pentium® processor, 8MB RAM, 850MB HDD
- 256KB external write-back cache
- Graphics accelerator for multimedia, CAD and other graphics-intensive applications

Acer

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Acer Milestones... March 1994 Acer introduces the first 90MHz Pentium® processor-based server.					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17 St. Patrick's Day	18	19	20	21	22	23
24 31 Palm Sunday	25	26	27	28	29	30

[redacted]

March

March 1996

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May 1996

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Win an AcerAltos™ 800/p in our *APRIL* giveaway!

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The AcerAltos 800/p

- 90MHz Intel® Pentium® processor
- 16MB RAM, 1GB SCSI HDD, CD-ROM drive
- 7 expansion slots and 6 drive bays provide flexibility unavailable in other entry-level servers

See sweepstakes rules and regulations on the back of the calendar

Acer

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Acer Milestones... April 1993 AcerLaser 86 is the first 256 grayscale laser printer under $2000.	1	2	3 Passover begins at sundown	4 Passover	5 Good Friday	6
7 Easter Sunday Daylight Savings Time begins	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24 Professional Secretaries Day	25	26	27
28	29	30				

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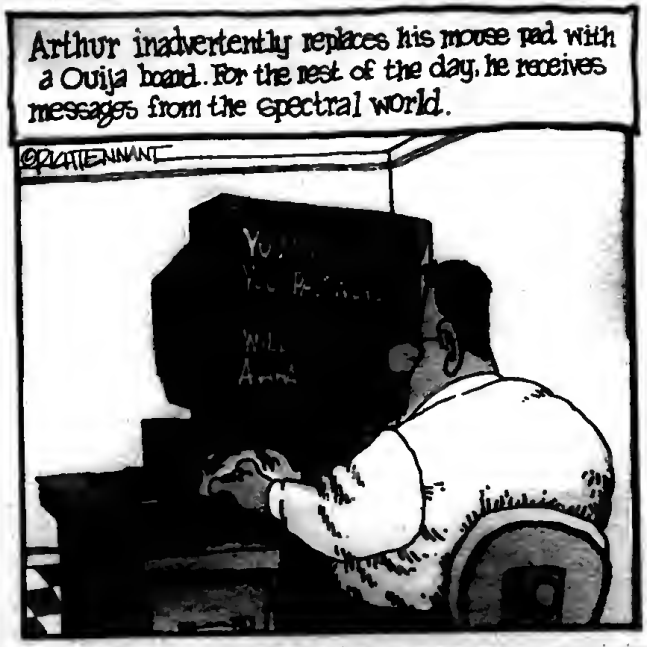
April



April 1996

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
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June 1996

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23 30	24	25	26	27	28	29

Win an Aspire™ Minitower in our *MAY* giveaway!

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The Aspire Minitower

- 100MHz Intel® Pentium® processor, 8MB RAM, 1GB HDD
- All-in-one multimedia—4X CD-ROM drive, 16-bit sound card, five-channel stereo mixer
- Full communications features, including fax modem, answering machine and voice-mail capability, speakerphone for teleconferencing

Acer

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Acer Milestones... ***May 1999*** *Acer acquires Altos Computer Systems - leading manufacturer of server solutions.*	**Acer Milestones...** ***May 1993*** *Acer America is the first to ship EnergyStar-Compliant*		1	2	3	4
5	6	7	8	9	10	11
12 Mother's Day	13	14	15	16	17	18 Armed Forces Day
19	20 Victoria Day (Canada)	21	22	23	24	25
26	27 Memorial Day (observed)	28	29	30 Memorial Day	31	

[redacted]

May

"IT WAS CLASHING WITH THE SOUTHWESTERN MOTIF."

May 1996

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July 1996

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Win an AcerNote™ Pro in our *JUNE* giveaway!

intel inside pentium

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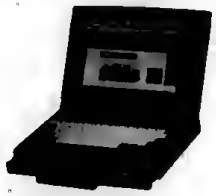

The AcerNote Pro

- 75MHz Intel® Pentium® processor, 8MB RAM, 540MB HDD, 10.4" active-matrix color display
- Contains three modular bays that allow you to adapt to any task
- Interchangeable hard drive, floppy drive, and 2 NiMH battery modules included
- PCMCIA slot for data communications

See sweepstakes rules and regulations on the back of the calendar

Acer

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Acer Milestones... **June 1991** *Acer introduces ChipUp, single-chip CPU upgrade.*	**Acer Milestones...** **June 1992** *AcerAcerMate V386SL is the first notebook to support PCMCIA and docking station simultaneously.*	**Acer Milestones...** **June 1993** *First Taiwan Editor's Trip - twenty American press members visit Acer Inc.*	**Acer Milestones...** **June 1994** *Acer ranks as 10th largest U.S. PC vendor.*			1
2	3	4	5	6	7	8
9	10	11	12	13	14 Flag Day	15
16 Father's Day	17	18	19	20	21	22
23 30	24	25	26	27	28	29

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June

June 1996

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
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August 1996

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18	19	20	21	22	23	24
25	26	27	28	29	30	31

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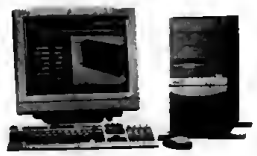

The AcerPower Minitower

- 75MHz Intel® Pentium® processor, 8MB RAM, 850MB HDD
- Diamond® Stealth™ video functionality for optimal multimedia performance
- PCI local bus architecture provides unparalleled performance

ACER

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	1 Canada Day (Canada)	2	3	4 Independence Day	5	6
7	8	9	10	11	12	13
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[redacted]

July

"QUICK, KIDS! YOUR MOTHER'S FLAMING SOMEONE ON THE INTERNET!"

July 1996

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
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September 1996

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8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

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The Aspire Desktop

- 100MHz Intel® Pentium® processor, 8MB RAM, 1GB HDD
- All-in-one multimedia—4X CD-ROM drive, 16-bit sound card, five-channel stereo mixer
- Full communications features, including fax modem, answering machine and voice-mail capability, speakerphone for teleconferencing

Acer

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Acer Milestones... **August 1991** AcerFrame is first multiprocessor system using Intel 486/50 with 64-bit bus.				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

[redacted]

August

IN A DISPLAY OF PERVERSE BRILLIANCE, CARL THE REPAIRMAN MISTAKES A ROOM HUMIDIFIER FOR A MID-RANGE COMPUTER BUT MANAGES TO TIE IT INTO THE NETWORK ANYWAY.

August 1996

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

October 1996

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

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intel inside pentium

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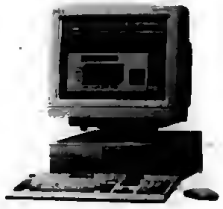

The AcerPower Desktop

- 75MHz Intel® Pentium® processor, 8MB RAM, 1GB HDD
- 256KB external write-back cache
- Graphics accelerator for multimedia, CAD and other graphics-intensive applications

Acer

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2 Labor Day	3	4	5	6	7
8	9	10	11	12	13 Rosh Hashanah begins at sundown	14 Rosh Hashanah
15	16	17	18	19	20	21
22 Yom Kippur begins at sundown	23 Yom Kippur	24	25	26	27	28
29	30			**Acer Milestones...** **September 1992** *Acer offers first symmetric multiprocessing version of TCP/IP*	**Acer Milestones...** **September 1994** *Acer introduces Out-of-Box-Experience (OOBE), making PCs easier to use*	**Acer Milestones...** **September 1995** *Acer America introduces revolutionary Acer Aspire desktops and minitowers for the home market.*

[redacted]

September

"LET ME GUESS - NO SURGE PROTECTORS...RIGHT?"

September 1996

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

November 1996

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

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- 7 expansion slots and 12 drive bays allow the 7000/p to grow and change with your network

Acer

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
[illegible] October 1989 One Millionth PC ships.		1	2	3	4	5
6	7	8	9	10	11	12 Columbus Day
13	14 Columbus Day (observed) Thanksgiving Day (Canada)	15	16	17	18	19
20	21	22	23	24 United Nations Day	25	26
27 Daylight Savings Time ends	28	29	30	31 Halloween		

[illegible]

October

"WHO'S GOT THE COMPUTER WITH THE SLOW RESPONSE TIME?"

October 1996

		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

December 1996

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

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The AcerPower Minitower

- 100MHz Intel® Pentium® processor, 8MB RAM, 1.2GB HDD
- Diamond® Stealth™ video functionality for optimal multimedia performance
- PCI local bus architecture provides unparalleled performance

Acer

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
					1	2
3	4	5 Election Day	6	7	8	9
10	11 Veterans Day Remembrance Day (Canada)	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28 Thanksgiving Day	29	30

[redacted]

November

November 1996

					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

January 1997

			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

Win an Aspire™ Minitower in our *DECEMBER* giveaway!

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- Full communications features, including fax modem, answering machine and voice-mail capability, speakerphone for teleconferencing

ACER

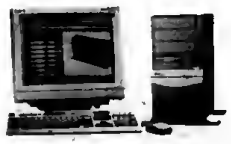
See sweepstakes rules and regulations on the back of the calendar

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	3	4	5 Hanukkah begins at sundown	6 Hanukkah	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25 Christmas Day	26 Boxing Day (Canada)	27	28
29	30	31				Acer Milestones... December 1992 Acer tops $1 billion in revenues.

[redacted]

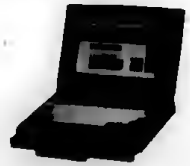
December

Acer keeps it all in the family.

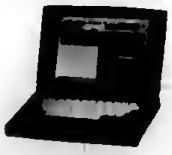


AcerPower™ Minitower

AcerPower Desktop



AcerNote™ Pro

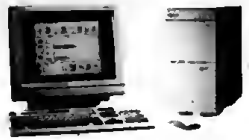


AcerNote Light

Aspire™ Minitower

Aspire Desktop

AcerAltos™ 7000/p Server



AcerAltos 800/p Server

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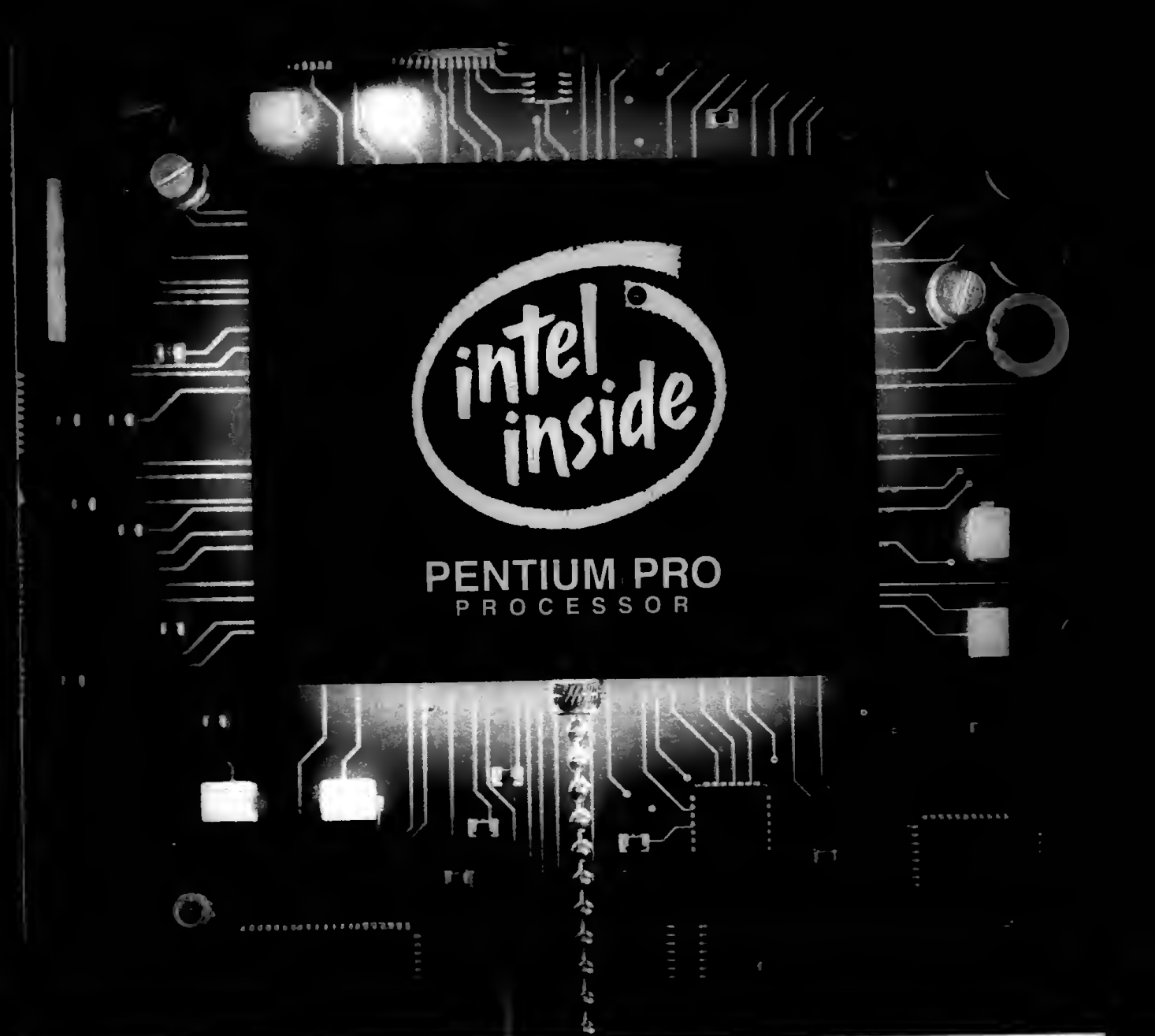

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Desktop Computing
PCs AND SOFTWARE • PORTABLE COMPUTERS

Mac users to Apple: Keep in touch in '96

By Lisa Picarille

"All I want for Christmas is my two front teeth."

Life for Apple Computer, Inc. would be so simple if only Macintosh users were that easily satisfied. But they have a much longer wish list for the Cupertino, Calif., computer maker.

In 1996, Apple must better meet demand for its products, beef up its presence in the corporate market, communicate its marketing message more clearly and reassert its leadership as an innovator, users agreed.

The Macintosh

"Apple needs 1996 to be the year they get rid of that huge backlog of [more than $1 billion in] orders," said Kevin Kelly, coordinator of educational media and technology for the Plymouth Public Schools in Plymouth, Mass., which have more than 400 Macintoshes.

Some customers said Apple has superior technology but simply fails to get the word out.

"There are many well-publicized stories when companies abandon the Mac, but Apple does little to make it known when a company succeeds using the Mac," said research scientist Mitch Hollander. He works at the Food and Drug Administration in Billerica, Mass., which has 100 Macintoshes.

While spreading the Macintosh gospel via advertising and better marketing is considered crucial to reaching the unconverted, Macintosh users suggested that Apple take heed of its loyal following.

"They used to have a much better grasp on what users wanted," said Harry Mott, a broadcast designer at the American Film Institute in Los Angeles. "There are still people at Apple willing to listen, but now it's just harder to find them."

Some suggested that Apple get in touch with users by disseminating more information and services via the Internet.

Apple already has a World Wide Web site, an on-line service and an electronic-mail system. But users are looking for more interactive contact with company executives, chat forums and "easier access to information about dual-platform environments," said Bill Monteith, executive director of MacIS, The Mason, Ohio-based consortium is packed with corporate Macintosh customers.

Stability wanted

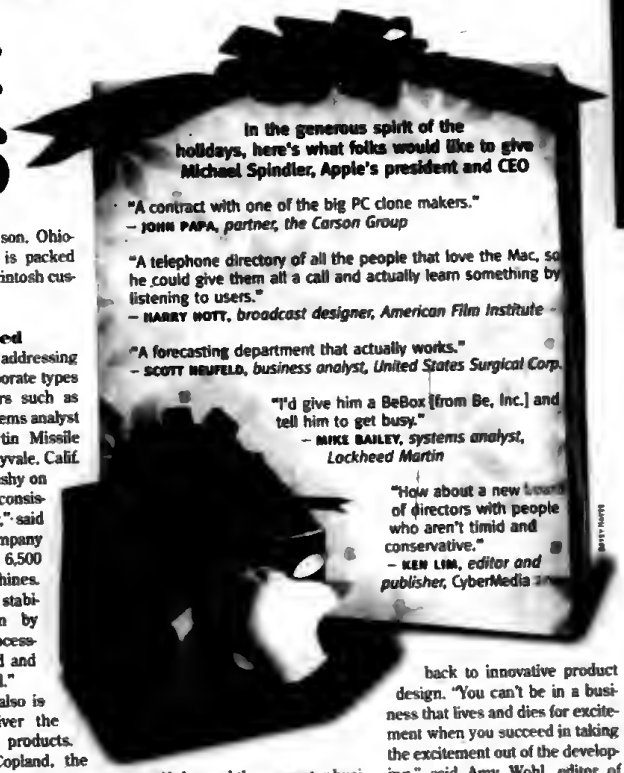
Indeed, Apple's addressing the desires of corporate types would please users such as Mike Bailey, a systems analyst at Lockheed Martin Missile and Space in Sunnyvale, Calif. "Apple is wishy-washy on enterprise. I want consistency and stability," said Bailey, whose company has more than 6,500 Macintosh machines. "Apple needs to stabilize the platform by making it multiprocessing, multithreaded and memory-protected."

The new year also is expected to deliver the next wave of products. These include Copland, the next-generation Mac OS; Shiner, Apple's Unix server, which is scheduled to be released in January; and Power Macintosh systems based on the Common Hardware Reference Platform co-developed with IBM.

Apple also should begin to diversify beyond the computer business into office equipment such as fax machines and integrated telephones, suggested Picter Hartsook, editor of "The Hartsook Letter," an industry newsletter in Alameda, Calif.

Others say Apple needs to get back to innovative product design. "You can't be in a business that lives and dies for excitement when you succeed in taking the excitement out of the developing," said Amy Wohl, editor of "TrendsLetter" in Narbarth, Pa.

Most Macintosh users and followers agreed there is one thing Apple doesn't need: another reorganization. Apple has undergone two major corporate restructurings since May.



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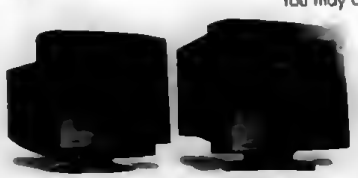

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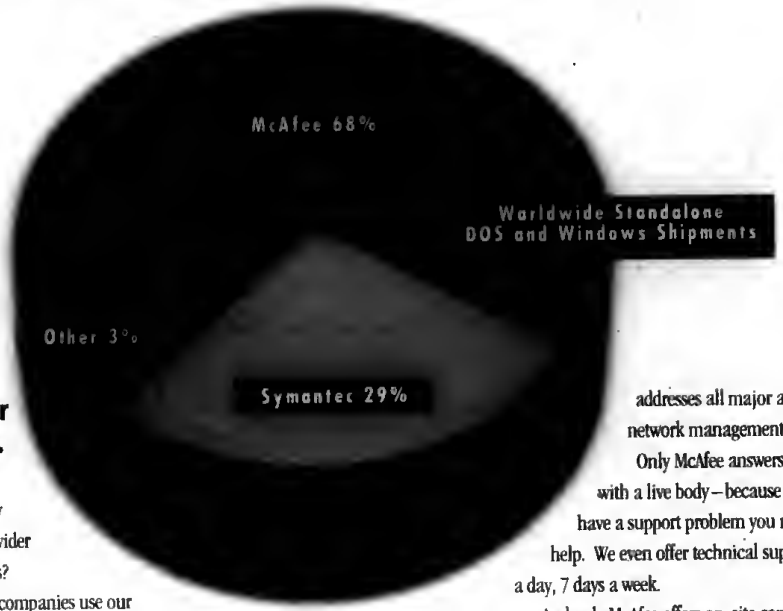
How The World's Biggest Anti-virus Company



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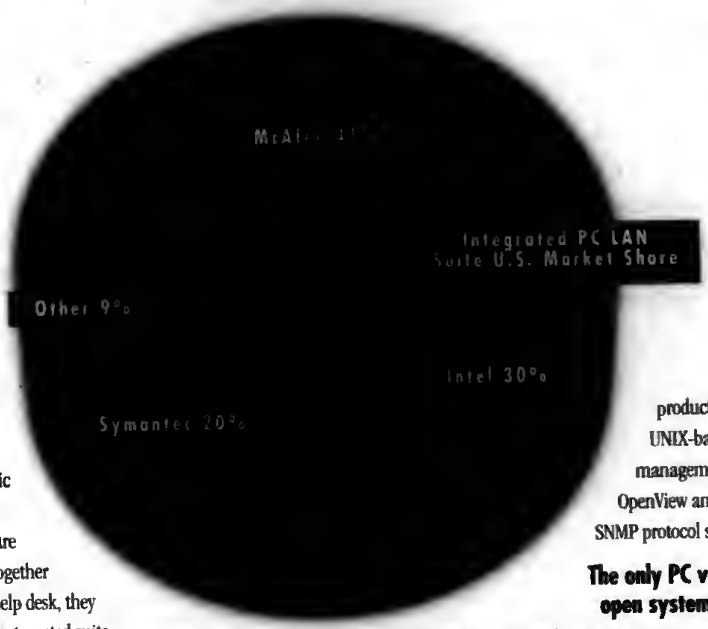

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Desktop Management	X	NO	NO
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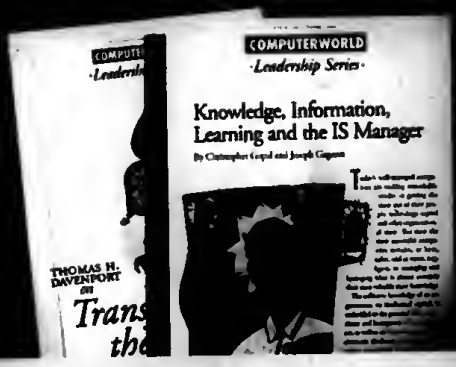

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The Time has Come for...

VIRTUAL DATA WAREHOUSING

INTERSOLV's Virtual Data Warehousing strategy provides fast access to the data you need — without building costly infrastructures.

INTERSOLV

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THE CASE FOR VIRTUAL DATA WAREHOUSING

Today, most organizations face a more complex set of business challenges than ever before. The boundaries among nations, markets and business relationships shift and blur almost daily. Product lifecycles continue to shrink. In organizations intent on thriving, the focus is expanding from simply managing operations to understanding individual customer needs and promptly meeting them.

This new focus, in turn, propels organizations to demand new kinds of support from their information systems groups. Corporate decision makers know that a better understanding of customer buying patterns enables the organization to build better products and provide better services that result in competitive advantage, and they know that the information they need is buried somewhere in the organization's computer systems. As a result, many IS executives now encounter enormous pressure to furnish the tools necessary for truly easy access and manipulation of the information required for better quality decision-making.

Given the vast amounts of data shoveled into most organizations' computers, the uninitiated might think it's comparatively simple to get the right information back out again. But many IS groups simply don't have the ready ability to respond to such demands. Stored in various locations and structures, the information essential to making the right decision at the right time is often difficult to access and, in its raw form, carries little meaning from a broad business perspective. Typically, the assorted, discrete databases housing narrow streams of raw operational data are hopelessly incapable of responding to demands for timely, consolidated information about an organization's customers, products and service competencies.

Data warehousing offers one of the best ways to translate this raw data and present it in ways that are useful to decision makers. As a database that provides end users with data extracted from online transaction processing (OLTP) and production systems, a data warehouse can support the business analysis activities that are so critical to staying competitive in these volatile times.

By establishing a data warehouse, IS managers can ensure that end users get access to the information they need while preserving the integrity of the organization's business-critical production systems.

However, building a complete physical data warehouse may be overkill.

Significant Benefits of Client/Server Computing

Enterprise access to data/resources	4.83
Ability to add capacity modularly	4.73
Ease of Use	4.63
Better quality user applications	4.63
Scalability of applications	4.51
Better development of tools	4.40
More efficient use of resources	4.38
Price/performance improvements	4.38
Faster IS response to business change	4.32
Allows IS to respond faster	4.24
To leverage best of breed tools	4.23

1 *Not Significant* — 6 *Very Significant*

SOURCE: SENTRY MARKET RESEARCH

Traditional approaches to data warehousing require laborious construction and maintenance of separate databases specifically designed to handle the business-oriented questions of corporate decision makers. Such supply-driven data warehouses are often IS-oriented and built to contain highly summarized, subject-oriented data structured for general use across the organization.

Typically, an IS manager attempts to determine the overall organizational need for decision-oriented

IS departments can reduce lead times to access enterprise information by using a demand-driven data warehousing process.

data, then develops a generalized model, chooses a physical database management system and loads a database containing all the data he or she believes anyone will want. The IS department must then maintain a large, generalized inventory of summarized data, as well as warehouse maintenance routines.

This traditional process consists of the following steps and issues:

* ***Identifying source data.***
This requires careful analysis of existing data and, often, development of an enterprise data model.

* ***Extracting data from operational systems.***
Typically, data must be moved from source systems to the data warehouse, which raises such issues as refresh rates, replication methods, maintenance, and adapting data to business needs.

* ***Transforming data for use by corporate decision makers.***
Data must make sense to those using it, different data representations used in different operational databases must be resolved, and data must be cleansed to eliminate anomalies.

* ***Storing the data.***
Can an existing database be used, or will a new one be necessary? What about a high-speed query environment to keep up with end-user demand?

* ***Accessing the data.***
Can existing end-user desktop tools be used? Or will proprietary tools need to be developed? Does the warehouse really provide answers to important business questions? Is it designed to be used by all of an organization's knowledge workers, or only some?

Experience has shown that this traditional supply-driven approach to data warehousing has resulted in a number of problems and limitations.

While IS departments undertake the intensive data extraction, transformation and loading processes necessary in traditional data warehousing, end users are being told to hang on and wait for the information they need to do their jobs. IS departments need to reduce, not lengthen, lead times to access enterprise information. This cannot be done using a supply-side approach to data warehousing.

Other key considerations for IS departments are constantly and rapidly changing information requirements. End-user information requirements change day to day and department by department. As more information becomes available, it triggers new questions that spawn demands for still more information. Too often, inflexible, traditional data warehouses simply cannot produce the new information decision makers need.

The inability to use current desktop tools, as well as high ongoing maintenance costs associated with traditional data warehousing approaches, compound these problems. Corporate decision makers need to spend their time analyzing information, not struggling with the proprietary interfaces of traditional data warehouses. As new data sources are established, end users need flexible and open tools to enable immediate access to key information.

The initial hardware and software expenses of traditional data warehousing constitute only a small part of the total cost, which is largely shaped by maintenance demands, particularly those incurred when data requirements change. These costs inevitably overburden understaffed IS groups.

Happily, there is an approach that will put users on the fast track to getting the information they need and want.

n a demand-driven data warehousing process, an organization focuses on determining the data needs of either individuals, departments or workgroups, concentrating on providing them with the data they need as expeditiously as possible.

To build a demand-driven data warehouse, an IS group minimizes the processes needed to produce and store information. Such a just-in-time approach ensures availability of the right informa-

tion to end users at the right time. Thus it can be quickly determined which data is most often required, and this insight can be used to establish patterns for storing data where and when it's needed. The bottom line is the organization can decide what data should be stored and what data should be staged, and when.

Available now, INTERSOLV's demand-driven Virtual Data Warehousing strategy — implemented via INTERSOLV's DataDirect product series — provides a unique architecture for accessing information today from existing data sources. Using the INTERSOLV Virtual Data Warehouse, IS staffers don't need to build complicated infrastructures. Instead, they're given the flexibility to migrate to storage-focused and subject-area databases as needed. The result is just-in-time data warehousing: a rapid approach providing infrastructure transparency for the organization while enabling immediate end-user access to enterprise information in business-friendly terms.

INTERSOLV understands that end-user requirements are dynamic, not static. The answer uncovered today proposes tomorrow's question. As business conditions change, so do the information needs of managers, which can be cost effectively met with INTERSOLV's Virtual Data Warehouse, a just-in-time information access solution.

INTERSOLV's Virtual Data Warehouse establishes access to the data first, without requiring heavy analysis and infrastructure. The result is faster time-to-market using fewer resources. Managers can access information from any data source in everyday business terms, working with the presentation tools of their choice. Once access is established, migration to traditional data warehousing architectures can occur as end-user requirements mandate.

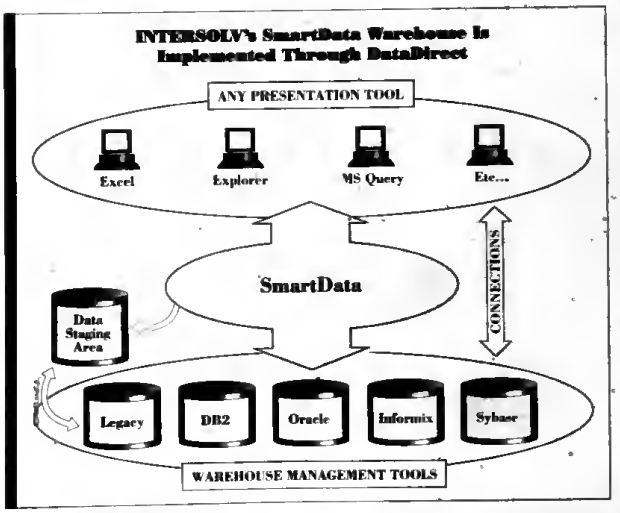
INTERSOLV's Virtual Data Warehouse utilizes DataDirect SmartData to make information easier to understand for all users. SmartData, which has been architected in accordance with the Open Database Connectivity (ODBC) standard, encapsulates complex database structures, unlocking the valuable business information trapped inside and making it easier to understand and use.

INTERSOLV's DataDirect Explorer, a new cooperative business intelligence environment that facilitates collection, analysis and dissemination of business information, uses an intuitive graphical interface and an open, standards-based architecture.

Together, DataDirect SmartData and DataDirect Explorer can be leveraged from any ODBC-enabled tool to access any ODBC-enabled database. Through INTERSOLV's Virtual Data Warehouse, the user's entire desktop (Excel, Word, Lotus 1-2-3, Visual Basic, etc.) can easily access information in any database.

INTERSOLV's SmartData solution has three components:

* ***The DataDirect SmartData Client ODBC driver,*** which func-



SOURCE: INTERSOLV

With INTERSOLV's Virtual Data Warehousing strategy, users migrate to subject-area databases as needed — creating a just-in-time warehouse.

tions just like any other ODBC driver in that it communicates with a data source using ODBC API calls and SQL syntax. But rather than passing the SQL directly to a data source (such as Oracle, Informix or DB2), the SmartData Client ODBC driver passes SQL requests to the SmartData Warehouse.

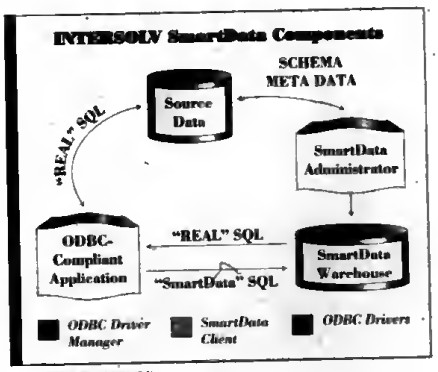
* ***The SmartData Warehouse***, a relational database that functions like a relational database management system (RDBMS) catalog. Rather than actual data, it contains information about the physical structures in a relational database and how those structures relate. Each SmartData Warehouse includes several layers of metadata: the SmartData Warehouse, SmartData databases, and SmartData SmartSets.

Within the Warehouse, logical databases are created for each data source to be encapsulated. Each logical database includes categories of tables and physical database views, called SmartSets, and the joins necessary to combine data from more than one table or view. SmartSets are strategically designed to provide answers to certain categories of business questions, such as invoicing or sales by employee, and dynamically generate the specific SQL statements needed to satisfy requests. In response to a query, then, the SmartData Warehouse returns specific SQL statements, which the SmartData ODBC driver passes to the data-specific ODBC driver for the appropriate data source. The end user is totally shielded from the complexities of SQL.

* ***The SmartData Warehouse Manager***, for building and maintaining SmartData Warehouses. The Manager allows power users and database administrators to easily define various constructs, such as databases, SmartSets and columns, thanks to its intuitive graphical user interface (GUI).

How does it all work? Any ODBC-compliant tool, such as INTERSOLV's DataDirect Explorer, Microsoft's Access or Lotus Development Corp.'s 1-2-3, communicates with the SmartData Client ODBC driver, which uses the SmartData Warehouse for system catalog information in the same way that a traditional ODBC driver for a specific database would communicate with a DBMS system catalog.

SmartData Client ODBC drivers use technical information in these SmartData Warehouses to dynamically generate the SQL necessary to satisfy the end user's request. The ODBC-enabled application then retrieves the information directly from the relational data source using database-specific ODBC drivers.



SOURCE: INTERSOLV

As a business intelligence tool, INTERSOLV's DataDirect Explorer ascends from the realm of query and reporting tools to full business intelligence. Easy enough for end users and robust enough for power users, DataDirect Explorer provides corporate decision makers with a number of distinct advantages in accessing enterprise information quickly and efficiently.

DataDirect Explorer can provide direct access to 35 database formats, thanks to ODBC driver support. Users can create sophisticated, drill-down database queries without knowing the complexities of SQL. The software also has a comprehensive scripting language that permits users to ask more questions about existing data sources. Explorer's Drill Down capabilities are event oriented, allowing users to ask different questions of the same data point.

Explorer's enterprise information-sharing component allows users to facilitate communication

INTERSOLV's DataDirect Explorer, with direct access to 35 database formats, gives users a complete business intelligence tool.

throughout an organization. Information retrieved by Explorer can be saved in ASCII and Rich Text Format (RTF). Routine queries and reports can be scheduled and disseminated automatically with Explorer's Job Scheduler.

Explorer uses MAPI to automatically detect and utilize an end user's mail program, allowing information retrieved by the software to be mailed using any popular electronic mail system. End users can immediately share query files and formatted reports at the touch of a button. Enterprise information sharing also saves money by distributing information electronically.

DataDirect Explorer can also boost end-user productivity with an easy-to-use, intuitive interface. Explorer's Chart Builder can create over 37 charts and graphs using a simple point-and-click interface and Explorer's Report Writer templates enable end users to quickly generate tabular reports, business forms, mailing labels, form letters and freestyle reports. Explorer also includes a customizable icon bar, extensive online help, stacked undo operations and instant icon identifiers.

When end users are building reports, they have at their disposal powerful report-writing features, including subtotals, totals, breaks, group-by, and headers and footers in any font.

And in writing these reports, users can take advantage of Object Linking and Embedding capabilities built into DataDirect Explorer. INTERSOLV supports OLE objects, enabling information from other programs to be included as part of an integrated, professional-quality business document.

Fully supporting these capabilities and products is INTERSOLV's ServiceDirect organization, which provides consulting, training and services offerings. For end users and managers, INTERSOLV provides DataDirect Explorer overviews, strategies for using SmartData and strategies for building a virtual data warehouse.

At the departmental level, power users and database administrators can take advantage of INTERSOLV's services in setting up SmartData, defining usage scenarios and planning for SmartData deployment.

From an enterprise perspective, INTERSOLV offers management services such as information access planning strategies as well as services that can help corporations understand the cost equation and paybacks of virtual data warehousing.

Because of its unique architecture for accessing information today using existing data sources, users of INTERSOLV's Virtual Data Warehouse are not required to build or navigate complicated infrastructures. Instead, they enjoy the flexibility to migrate to storage-focused and subject-area databases as needed. With DataDirect, organizations benefit from:

* ***Quick access to accurate, consistent corporate information,*** presented in concise business terms. INTERSOLV's Virtual Data Warehouse focuses on end user requirements and doesn't require IS departments to go through intensive extraction, transformation or loading processes for establishing a data warehouse. With DataDirect SmartData, end users can transform existing data sources into information described in everyday business terms. End users can now concentrate on the information they need rather than how to get it.

* ***Flexibility to deal with multiple data structures,*** thanks to an open architecture. INTERSOLV's Virtual Data Warehouse is built on an industry-standard open architecture. As organizations implement traditional data warehousing architectures, INTERSOLV's approach can itself migrate from a virtual environment into a physical data warehouse.

* ***Easier development and low-cost maintenance,*** thanks to easy, centralized administration and enhanced security features. INTERSOLV's Virtual Data Warehouse provides users with safe and secure access to corporate data, easing development requests and requirements for end-user data access. Using SmartData ensures a consistent interface to the company's data sources. And in

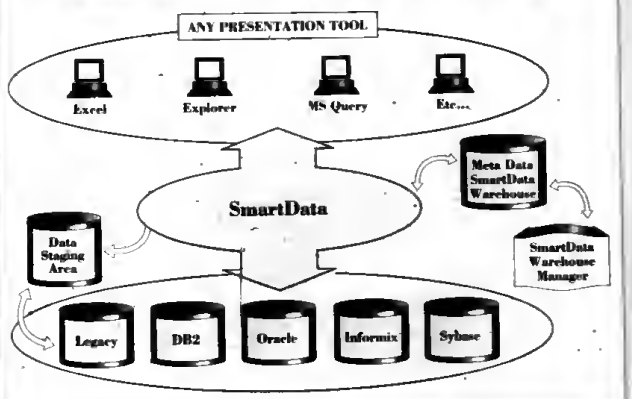
INTERSOLV Data Encapsulation: The Next Generation

To furnish non-technical computing users with true ad hoc access to corporate data, the relational structure of the data needs to be simplified and translated in an encapsulation meta layer.

Construction of such meta data can be quite laborious, depending on the complexity of the data sources, the number of data structures that must be encapsulated and the needs of end users. In extreme cases, several months and innumerable man-hours can be consumed by the task. However, the benefits are substantial: The new layer of genuinely user-friendly information boosts productivity; the more meta data is used, the more valuable it becomes.

Early data encapsulation efforts — the first generation — are based on closed, proprietary architectures. Only certain tools can be used within these architectures, limiting the potential of the data encapsulation efforts. And since today's computing environment is populated with hundreds of widely used software packages capable of manipulating and analyzing corporate information, many of them specialized for particular tasks, it's clear that proprietary meta data adds little value in the many environments that utilize several different tools or software applications.

INTERSOLV's Second Generation Encapsulation Technology



SOURCE: INTERSOLV

INTERSOLV now offers what organizations need to access and exploit corporate information: an open meta layer of encapsulated information. Only Intersolv provides an open data encapsulation solution with SmartData. Because SmartData has been implemented as an ODBC driver, it can be accessed by any ODBC-compliant tool. All ODBC-enabled applications can now rely on a single meta-data model and interface to deliver consistent, accurate query results and provide a practical use of the meta data. Users of all ODBC-enabled tools can work within the same consolidated, easy to use warehouses of business information.

Whether it's the analytical capabilities of a spreadsheet, such as Microsoft Excel or Lotus 1-2-3, or the development power of a tool like Access or PowerBuilder, INTERSOLV's SmartData Warehouses can simplify end users' query and data access efforts.

Developers can also leverage SmartData's open architecture. With SmartData, end users and developers can utilize the same logical representation of the database. This allows developers to work with the same language as users. Applications can be built faster because end users and developers can easily understand the application's data requirements.

Respond effectively to user needs by fast-tracking access to data with INTERSOLV's Virtual Data Warehousing strategy.

designing SmartData, INTERSOLV focused specifically on the administrative requirements of setting up and maintaining the Virtual Data Warehouse.

* ***Ability to communicate query results across the organization.*** INTERSOLV's Virtual Data Warehouse makes it easy to implement enterprise information-sharing. With DataDirect Explorer, end users can deploy reports and queries to any user throughout the organization and even across the Internet. Explorer allows users to export reports and queries that can be viewed in nearly all word processors and integrates these capabilities into end users' electronic communications environments.

* ***Support for dynamically changing business requirements*** by enabling end users to ask more questions by drilling down into the data. INTERSOLV's Virtual Data Warehouse allows end users to dynamically retrieve information from any data source, enabling them to think outside of the physical boundaries of a traditional data warehouse. As new data is needed, additional SmartSets can be added to a manager's Virtual Data Warehouse.

* ***A set of powerful analytical tools*** that exploits existing desktop toolsets. INTERSOLV's Virtual Data Warehouse utilizes existing communications architectures, hardware and software to bring business information to management. And SmartData's open architecture means existing investments in desktop tools can continue to be leveraged. Organizations can preserve their freedom to continue to choose best-in-class solutions for their diverse information technology needs.

INTERSOLV's new Virtual Data Warehouse will continue to be enhanced in the months and years ahead. Organizations adopting the technology will enjoy ongoing improvement in their corporate decision makers' productivity and effectiveness without sacrificing their investments in current information technology infrastructure or knowledge base.

Future developments of INTERSOLV's Virtual Data Warehouse will focus on agent processing and ubiquitous access to data.

Sometimes corporate decision makers need to be alerted as soon as important changes in data occur. INTERSOLV plans to evolve its Virtual Data Warehouse to proactively handle data access in which server-based processes alert end users to key changes in data. Based on a component architecture, this technology will create an automatic access environment that asks the same questions routinely asked by end users.

Ultimately, end users should not need to know where data resides. Using server-based technology, INTERSOLV plans an enterprise access architecture within which end users will access data not by location, but according to business requirements. In such an architecture, data may reside in physical warehouses or a source system. Wherever data is located, end users will be able to access it from any source.

To learn more about how INTERSOLV's Virtual Data Warehouse can make your organization more competitive and your corporate decision makers more effective and productive, contact INTERSOLV.

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* **World Wide Web:** http://www.intersolv.com

3M Co. has introduced the 3M Precise Mousing Surface, a microthin computer mouse pad designed to enhance mouse and user performance.

According to the St. Paul, Minn., company, the Precise Mousing Surface is based on 3M's microreplication technology, which uses precisely shared, three-dimensional structures on surfaces. The surface lets users maintain constant contact among the mouse, pad and software.

The Precise Mousing Surface costs $15.

▶ *3M*
(612) 733-1110

McAfee Associates, Inc. has introduced VirusScan 2.0 for Windows 95 and BootShield, anti-virus software products.

According to the Santa Clara, Calif., company, VirusScan 2.0 has a 32-bit virtual device driver and a real-time scanning engine. The engine identifies viruses in memory when executable files are run, copied, created or renamed; when disks are inserted; or when the system is shut down. VirusScan 2.0 lets users configure automatic scanning options. It supports the Windows 95 explorer interface.

BootShield was designed to provide real-time boot virus protection by masking a computer's boot image and identifying changes associated with boot viruses. It can be installed on DOS, Windows, Windows 95 and Windows NT systems.

VirusScan 2.0 costs $65. BootShield costs $35.

▶ *McAfee Associates*
(408) 988-3832

Ask LCD, Inc. has introduced Impact 400, an LCD panel.

According to the Lyndhurst, N.J., company, Impact 400 is an active-matrix Super VGA 800- by 600-pixel display panel. It was designed to provide high pixel resolution for diagrams, graphs, text and computer graphics in more than 16 million colors.

Impact 400 remembers adjustments individually and restores the right settings when users switch between modes. It lets users display computer images from PCs and Macintoshes and can be used with most overhead projectors. It is compatible with Super VGA, VGA and Extended Graphics Array (1,024- by 768-pixel) formats. The product includes an infrared remote mouse.

Impact 400 costs $6,295.

▶ *Ask LCD*
(201) 896-8888

Interlink Electronics Corp. has introduced RemotePoint Plus, a cordless mouse.

According to the Camarillo, Calif., company, RemotePoint Plus is a handheld, infrared PC pointing device that has 360-degree, thumb-driven cursor control and dual mouse/button support. It has four buttons that can be assigned as many as 15 presentation tools, media effects and program-launch functions.

RemotePoint Plus can be used as a primary mouse or with another desktop mouse. It plugs into a standard serial port. It can run parallel to any standard serial or 9-pin mouse and has a range of 40 feet. RemotePoint Plus was designed for use with Microsoft Corp.'s Windows 3.1 or Windows 95 and uses two AAA batteries.

RemotePoint Plus costs $200.

Interlink's RemotePoint Plus

▶ *Interlink Electronics*
(805) 484-8855

Dietrich & Streicher, Inc. has announced Bansai MicroFax, a document scanner and portable, send-only fax machine.

According to the San Rafael, Calif., company, Bansai MicroFax lets users send faxes from any standard telephone. It also can function as a document scanner when plugged into a fax modem on a PC or Macintosh that uses a telephone card.

Bansai MicroFax is 11¾ inches long and weighs 20 ounces.

It costs $299.

▶ *Dietrich & Streicher*
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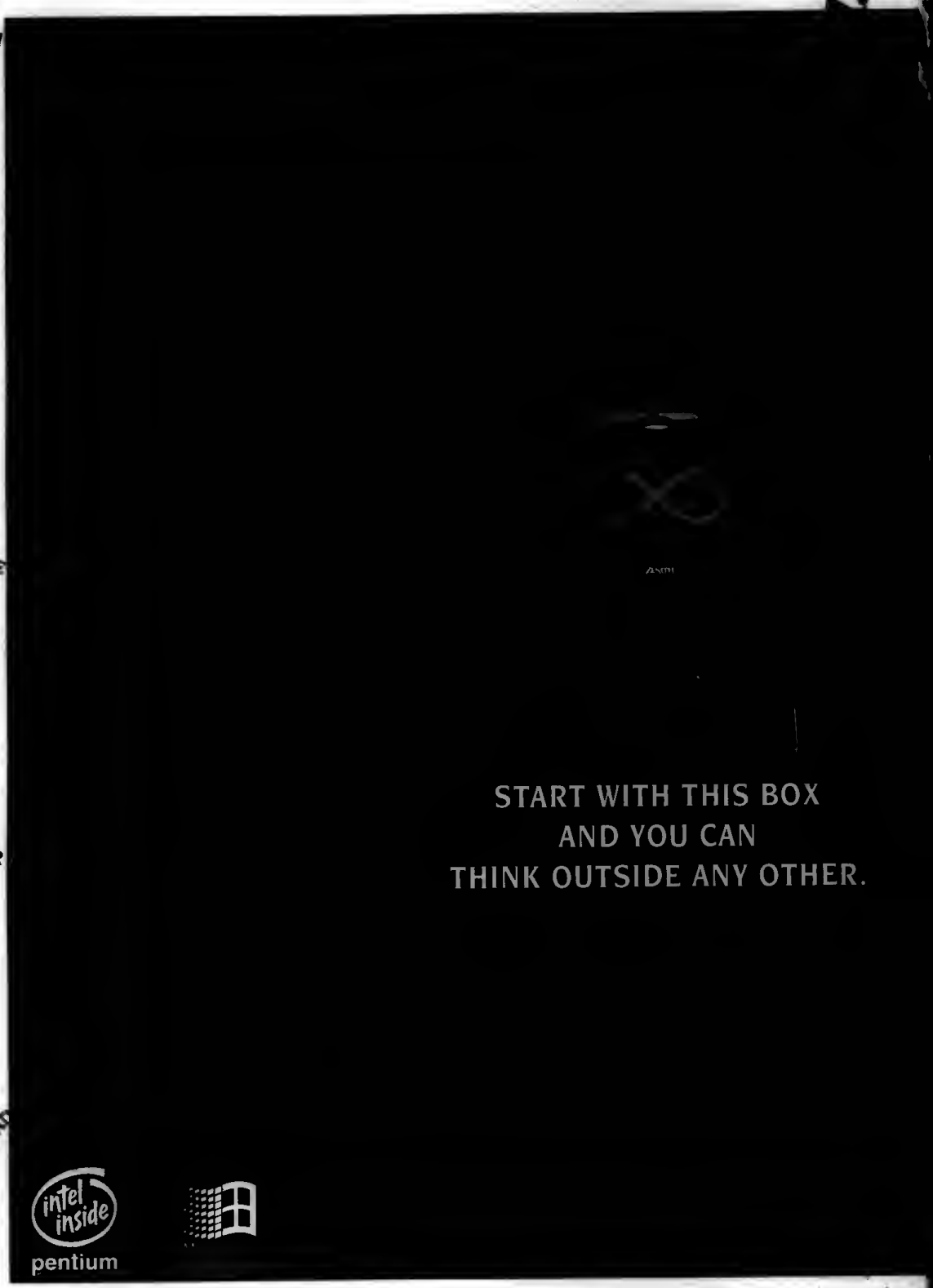

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AND YOU CAN
THINK OUTSIDE ANY OTHER.

intel inside
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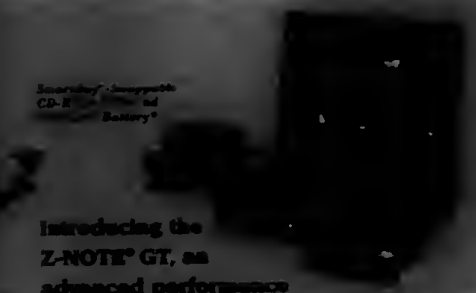
PROCESSORS KEEP UP. ➤



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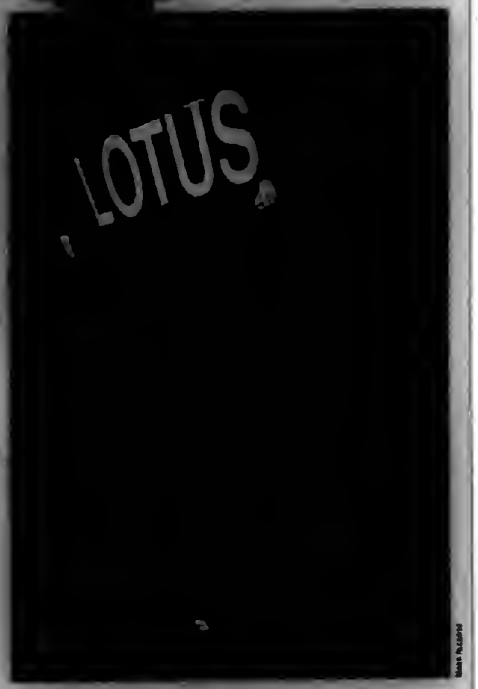

When IBM forked over $3.5 billion for Lotus Development Corp., it said Lotus and its Notes product were the path users would follow to the next generation of computing. This Boston street sign might suggest otherwise, but with Boston drivers, anything is possible.

CEO computer camp?

For top-level technophobes, that's one way out

By Thomas Hoffman
SCOTTSDALE, ARIZ.

By most accounts, Peter St. John Reid is a successful, confident guy.

As CEO of Titan Steel Corp., Reid has deftly guided the Baltimore-based steel processor from $30 million to $90 million in revenue during the past eight years. All while fending off attacks from Japanese and Brazilian rivals.

Yet when it comes to using a PC, Reid has been a scaredy-cat. "He's absolutely terrified of using a computer. His 6-year-old son [Andrew] knows more about them than Peter does," claimed Reid's wife, Sharon.

To conquer his fear, Reid recently joined 60 other top executives at a four-day computer literacy course called the CEO Technology Retreat. Sponsored since 1993 by Computer Associates International, Inc., Electronic Data Systems Corp. and The CEO Institute, the semiannual courses are intended to demystify the aura of information technology.

The symposium has two goals: to give these captains of industry a grassroots understanding of how to work a PC and fax machine and to help them bridge the communications gap with their chief information officers. The training sessions are interwoven with panel discussions chaired by CIOs and high-tech executives on topics such as increasing productivity through technology.

They get five-star meals *and there is a golf course outside, but these CEOs log their time at a PC keyboard. They learn how to type, use a mouse and even surf the Internet.*

"This course will definitely help me relate better to our technical people when it comes time to make [technology] budget decisions," said Glen Holden, chairman and CEO at Global Health Network in Los Angeles.

For a $6,250 registration fee, attendees receive five-star meals, special events, programs for their spouses and full use of equipment. But most attendees are there to master word processing, spreadsheets and electronic mail.

"When my people put a PC on my desk, I asked them, 'What do I need it for?' 'Spreadsheets,' they said. Well, I've got a [chief financial officer] and a finance team who can do that," said Sander A. Flaum, president and CEO at Robert A. Becker, Inc. Europe RSCG, a New York-based advertising agency. Yet like his peers at the retreat, Flaum finally relented. "I figured I should get some of the essential skills down," he acknowledged.

The executives use Texas Instruments, Inc. laptops based on 50-MHz Intel Corp. I486DX2 chips to learn how to type and use a mouse. Then they graduate to word processing and running spreadsheets using Microsoft Corp.'s Office software suite. Later on, they surf the Internet using MCI Communications Corp.'s NetworkMCI Business software.

Instruction for these type A personalities is very hands-on. A teaching assistant tutors three CEOs at a time. And despite the lure of championship golf courses outside the resort windows, most of the students show up for classes early and stay late to squeeze in as much PC time as possible.

CEOs say *the camaraderie of colleagues makes the PC training less intimidating*

By going through the PC training with other tycoons, the CEOs can see they aren't alone in their technophobia. "It can be very intimidating to ask someone in your own company to help you use a PC," said Holden, who was U.S. ambassador to Jamaica during the Bush administration. "But when you run a company, you're constantly relying on technical specialists to help run your business, whether they're lawyers, accountants or technicians."

Is the end near for the floppy drive?

Up-and-coming drives offer 100M bytes+ of space

By Ron Condon and Bob Francis

Will the Internet render the floppy drive a thing of the past?

As users store more and more graphics and start to download video from the Internet, the humble floppy disk's capacity of no more than 2.88M bytes is beginning to look inadequate. The question is: What technology is likely to come along and replace it?

PC storage

Controlling costs

Several candidates are presenting themselves, according to Stan Corker, an analyst at International Data Corp. in Framingham, Mass.

However, for these possible replacements to succeed, their costs must fall below the $200 price tag of a floppy drive, and they must offer at least 100M bytes of capacity and the ability to use existing PC slots.

Possible alternatives to the floppy include the following:

- Iomega Corp.'s Zip, a drive that is slightly fatter than a floppy but holds 100M bytes, or 70 times, as much data. The drive costs $200; the disks are $15 each.
- Iomega's new 1G-byte Jaz drive, which plugs into the PC via a SCSI interface and has two double-sided, 3½-in. platters. The drives cost $499, and the removable disk costs $99.
- The Floptical drive, a 120M-byte, 3½-in. magneto-optical disc that its makers — 3M Co., Matsushita Electric Industrial Co. and Compaq Computer Corp. — hope will become a standard. Analysts said these drives will initially add about $150 to the cost of a PC.

Analysts said they expect Compaq to introduce a system with a Floptical drive in the second quarter of next year, but Corker said he wonders if that will be too late.

"The Floptical is good technology, but the Zip drive has the costs down, and it's already out there," Corker said. However, the Zip drive doesn't fit into the standard floppy drive slot on a PC, which will limit its applications.

After the millennium

If the Zip and Floptical drives don't establish themselves by the end of next year, users may have to wait until around 2002 when a rewritable CD using the newly agreed-upon Digital Video Disk standard becomes available.

This may be the most likely scenario, according to Richard Watts, vice president and general manager of Hewlett-Packard Co.

"I don't see anything taking the place of the floppy drive before the end of the decade," he said.

Condon is an IDG News Service correspondent in London.

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More for the buck

Over time users are finding more powerful PCs for the same prices

For $2,000 users get . . .

Year*	1994	1995	1996
Processor	100-MHz 486 DX4	90-MHz Pentium	133-MHz Pentium
Hard drive	270M bytes	540M bytes	850M bytes
RAM	8M bytes	8M bytes	16M bytes
Operating system	Windows 3.1/DOS	Windows 3.1/DOS or Windows 95	Windows 95 or Windows NT
CD-ROM	None	Four-speed	Six-speed

*For December of each year

Source: Workgroup Strategic Services, Inc., Portsmouth, N.H

PC prices take a slide

Hewlett-Packard trims cost of Pentium units

By Jaikumar Vijayan

PC prices are heading south once again, as the cost of chips and components continues to tumble.

Fast-rising Hewlett-Packard Co. recently rolled back prices by up to 16% on some of its Pentium-based PCs for the corporate market.

That move is unlikely to trigger a price war, but it does raise the stakes for other vendors during the next few months, analysts said.

Still, the average price of popular, fast-selling configurations will remain stable, analysts said.

Compaq Computer Corp. and IBM said they have no immediate plans to respond to HP's price cuts. But analysts believe they will.

"To remain competitive, most of the big guns will have to follow suit," said Nathan Nuttall, an analyst at Giga Information Systems in Norwell, Mass.

At the least, consumers will get more robust features for the same price (see charts). Those features include emerging multimedia technologies such as six-speed CD-ROM drives and three-dimensional acceleration.

"What's interesting is that the [money] we spend on a PC isn't changing all that much, but what you get for your buck is a lot more," said Tom Balzarini, an enterprise network specialist at Associated Grocers, Inc. in Seattle.

Intel Corp.'s quarterly processor price announcement, which is due in January, also is expected to drive prices down.

Vendors also are expected to cut the cost of their current Pentium models, especially those on the low end, to make way for 150-MHz Pentium systems that will ship in the first quarter next year.

Though Intel hasn't announced the 150-MHz chip, several vendors last month showed systems based on it at Comdex/Fall '95 in Las Vegas.

"Next year, the sweet spot will be the 133-MHz and the 150-MHz Pentium systems. The Pentium Pro will still be out of reach for most," said Jennifer Munson, an analyst at Workgroup Strategic Services, Inc. in Portsmouth, N.H.

The introduction of the 150-MHz chip will accelerate the demise of the 75-MHz Pentium, pushing 90- and 100-MHz systems to the low end of the price spectrum — between $1,500 and $1,800, analysts said.

Breaking the $2,000 barrier

HP's latest move drops the price of its midrange Pentium-based PCs to less than $2,000. For instance, an HP Vectra XM3 based on a 100-MHz Pentium chip, with 8M bytes of RAM and 840M bytes of hard disk space, costs $1,809. That's a 16% drop from its earlier price of $2,155.

At the higher end, a 133-MHz Vectra XU PC with a 1G-byte hard disk drive and 16M bytes of RAM will cost $3,583, or 12% less.

In keeping with predictions about the 75-MHz Pentium's demise, HP's 75-MHz Vectra systems cost about $1,500.

. . . and for $2,500 users get:

Year*	1994	1995	1996
Processor	75-MHz Pentium	90-MHz Pentium	133-MHz Pentium
Hard drive	340M bytes	850M bytes	1G byte
RAM	8M bytes	16M bytes	16M bytes
Operating system	Windows 3.1/DOS	Windows 3.1/DOS or Windows 95	Windows 95 or Windows NT
CD-ROM	two-speed	four-speed	six-speed

*For December of each year

Source: Workgroup Strategic Services, Inc., Portsmouth, N.H

Win 95 stirs PC market in Japan

PC market grows 60% in '95 as 32-bit Windows takes off

By Rob Guth

TOKYO

Japanese consumers like at least one American product: Windows 95.

In its first four days on the market, the Japanese version of Microsoft Corp.'s Windows 95 passed the 200,000-copy mark, signaling how rapidly Japan's PC market is changing.

Microsoft expects to sell 5 million copies of Windows 95 in the Japanese market in the first year. This compares to the 6 million copies of Windows, mostly Version 3.1J, sold to date in Japan, according to Charles Stevens, Microsoft's vice president in the Far East. Windows 3.1J shipped in May 1993.

Windows 95

Researchers at IDC Japan Ltd. and Dataquest Japan each predict that 1 million preinstalled copies will ship in what's left of this year. Dataquest predicts about 500,000 upgrades will be sold in the same period.

Windows 95 is expected to add fuel to the fire of the Windows phenomenon, which is reshaping the PC market in Japan.

Microsoft is late rolling out the initial Japanese version of Windows. But with Windows 3.1J, Microsoft has brought cross-platform standardization to a market that had been dominated by proprietary PCs from companies such as NEC Corp. and Fujitsu Ltd.

Windows' Japanese character-processing engine offers standardization that has grabbed the attention and development budgets of Japan's software houses.

The success of Windows, coupled with the ongoing fall in PC prices in Japan, is spurring white-hot growth in the PC market.

That market will grow 60% this year compared with last year, said Katsushi Shiga, a senior industry analyst at Dataquest. He said he expects that rate to drop slightly next year, to between 45% and 50%; unit shipments will rise to 7.3 million from this year's 5.3 million, he said.

Guth is an IDG News Service correspondent in Tokyo.

Briefs

HP trade-up program

Hewlett-Packard Co. this week will formally launch its Client/Server Trade-Up program. For the next five months, customers can trade in any brand of PC server. HP will apply the trade-in value toward the purchase of any HP PC and network server based on the Intel Corp. architecture. For example, users who trade in a Compaq Computer Corp. ProSignia 486/66-MHz system with 2G bytes of disk space and 32M bytes of RAM will fetch a $1,000 credit. HP will remove the old equipment and pay for shipping. The program is available in the U.S. and Canada through April 30.

A handheld as tough as Texas

Texas Microsystems, Inc. in Houston next week will announce a rugged handheld computer based on prototypes developed for the U.S. Army. The as-yet unnamed computer — the prototype was called Grunt — will cost about $3,975. The unit weighs just over 3 pounds. It is rugged enough to survive a fall onto concrete and runs Windows 95, according to the company.

New video standards

The Video Electronics Standards Association (VESA) has approved the Enhanced Video Connector standard for video output to PCs, workstations and displays. The standard will provide higher-resolution displays and refresh rates for multimedia. VESA also approved a standard for flat-panel displays that is expected to lower costs and speed the time to market for new models.

Compaq makes net investment

Compaq Computer Corp. has made an equity investment in Intelton Corp., an Ocala, Fla.-based manufacturer of in-home networking technology. Compaq is the first PC manufacturer to invest in Intelton's implementation of the Consumer Electronics Bus standard, which provides connectivity between in-house LANs and outside services such as utility companies, for example. The amount of the investment wasn't disclosed.

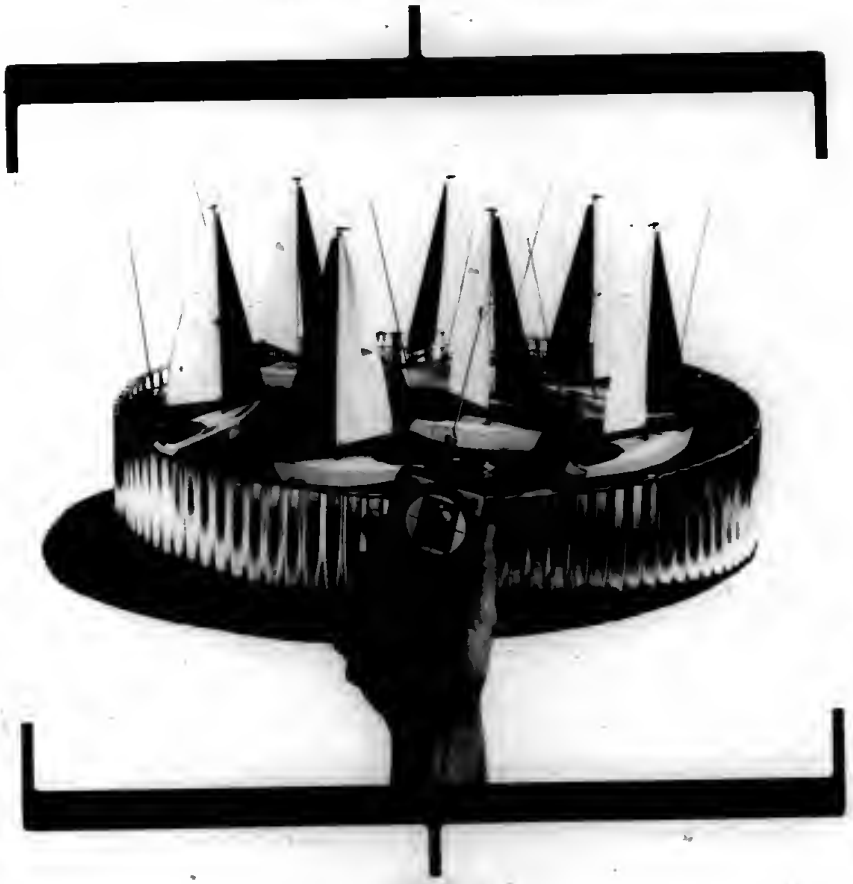
Sony plant reopens

A Sony Corp. lithium ion battery plant that closed after a fire at the site in early November, reopened Dec. 1, according to a company spokesman. Sony, the leading supplier of the lithium ion cells that supply power to high-end notebook PCs, hopes to resume full production at the plant by February, the spokesman said. He said the company hopes to regain its previous production levels of 3 million units per month.

Toshiba invests in DRAM plant

Toshiba Corp. recently said it will build a $1.3 billion manufacturing facility for microprocessors and 64M-bit dynamic RAM. The plant is expected to be finished in 1998, company officials said. Production will start in the latter part of next year, they said.

"Ideally, I'm not always at the office. I need a system that alerts me to a PC problem and lets me fix it from wherever I might be."



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DIGITAL, SPRINT TO OFFER BETTER DESKTOP VIDEOCONFERENCING, 59
SEAGATE EXPANDS NETWORK BACKUP SOFTWARE, 60

Beefing up document management

Cheaper than workflow, software can simplify file functions

By Tim Ouellette

Users are looking to automate the movement of the documents they create, add images to the document mix and integrate various pieces of documents into new files.

Document management software organizes and stores electronic files, provides version control, maintains security and allows users to easily search for and retrieve documents.

Document management typically is cheaper than workflow and imaging systems, which usually require lots of integration and are targeted at specific applications (see chart), said Ronni Marshak, an analyst at Patricia Seybold Group in Boston.

But integrating workflow and imaging with document management is becoming more and more important.

"People are realizing that part of a document's life cycle is not just revision, but where it goes next," said Carl Frappaolo, executive vice president of Delphi Consulting Group in Boston.

"Part of our problem is geography. We need to move all our information around," not just manage it locally, said Bill Roach, records manager at Basin Electric Power Cooperative. The Bismarck, N.D., utility is integrating document management software with workflow, imaging and electronic forms for all users, not just for scattered departments and applications.

Not just memos anymore

But documents aren't just word processing or spreadsheet files anymore, either.

For example, at EG&G Sealol in Cranston, R.I., document management is used to manage engineering drawings. Some 100 engineers use the system now; the manufacturing firm plans to add sales-order tracking and then general document support to bring all 700 users to Novell, Inc.'s SoftSolutions software.

Managing the drawing files with document management software means there is no longer any doubt about what version employees are working with or problems manufacturing to the wrong specification, said Marc Lataille, manager of software applications.

Complex files

Beyond separate document types are compound documents, which contain componcots such as a chart or graphic that is linked or embedded from another document.

According to Marshak, vendors are still struggling to manage these files, mainly because there are few editing tools that can manage their creation and assembly. For example, while the user may want the graphic to remain unchanged, he may want the chart to reflect updated data in its original spreadsheet file.

And there are social issues as well.

"People always considered documents to be personal. Now we want documents to be considered a corporate resource that they should share," said Margaret Melisko, team leader at the Arizona Public Service in Phoenix.

What's next?

How about the death of a document?

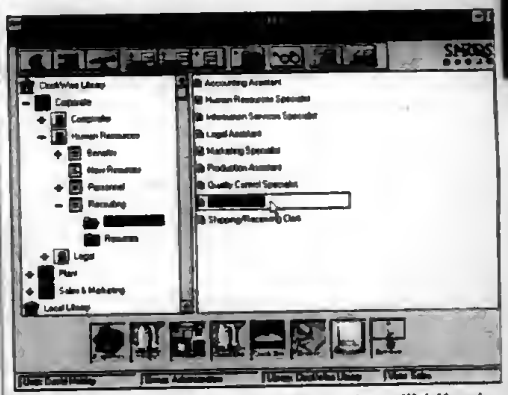
"Vendors are realizing that the document life cycle includes death, managing both archiving and then destruction of the document," Frappaolo said.

Managing flocks of docs

Typical workflow or imaging installations fit up to a few hundred seats; document management software installations are much larger

Company	Seats	Software
Shell Oil	42,000	Saros' Document Manager
Glaxo	11,000	Documentum's Documentum
Du Pont	10,000	PC Docs' Open Docs
EG&G	700	Novell's SoftSolutions

Saros to deliver secure info over Internet



Saros' @Mezzanine *document management system will deliver information securely over the Internet*

By Stuart J. Johnston

As companies begin to look at the Internet as a way to publish corporate data and enhance internal communications, Saros Corp. wants to be there with a tool to help manage that process securely.

Bellevue, Wash.-based Saros will ship an Internet-enabled version of its document management server, which runs under Windows NT, this month. The product is due to ship in the first quarter. Pricing hasn't been announced.

Called @Mezzanine, the Internet document server provides the same features that Saros' Mezzanine 3.5 document management server provides, said Jim Meyer, Saros' vice president of marketing.

Those features include document-level security, version control, archiving and retention management, Meyer said.

Saros, founded in the late 1980s, initially developed a document management system with an OS/2-based server and Windows clients. The company has since expanded its server family to encompass IBM's AIX, Hewlett-Packard Co.'s HP-UX, Sun Microsystems, Inc.'s Solaris, Novell, Inc.'s NetWare and Microsoft Corp.'s NT.

The @Mezzanine package was

Saros, *page 60*

DS Standard trims configuration time of NDS trees

By Laura DiDio

Sometimes you can't see the trees for the configuration.

Indeed, the proper setup and configuration of a Novell, Inc. NetWare Directory Services (NDS) tree is arguably the toughest challenge users face in migrating from NetWare 2.x and 3.x to NetWare 4.1 LANs.

Netware Directory Services

But a recent Windows-based software tool from Preferred Systems, Inc. in West Haven, Conn., eases that burden. The tool significantly cuts down configuration and migration time — often from days to hours.

Version 2 of Preferred Systems' DS Standard NDS Manager gives network administrators the ability to design and configure Version 4.1's NDS trees offline.

NDS functions as a master back-end database that houses a complete inventory of all users and devices attached to NetWare 4.1 servers. It also gives users the ability to log on just once and access any network resource regardless of location.

Now, using DS Standard NDS Manager, network administrators can set up simulated NDS database trees and view the prototype results without committing to the configuration until they are certain of the prototype NDS tree.

"You can model the directory tree offline but using real data," said Peter Kuo, a certified NetWare instructor who also runs DreamLAN Network Consulting Ltd. in Toronto. "When you find the one that suits you best, DS Standard will modify the actual directory tree with a single click."

Glen Coleman, a network administrator at the Ohio Department of Health in Columbus, said he turned to DS Standard when he decided to migrate two

DS Standard, *page 60*

Preferred Systems' *DS Standard NDS Manager Version 2 helps users cut down configuration and migration time*

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Key #41207

DEC, Sprint ease videoconferencing

By Tim Ouellette

Digital and Sprint are giving videoconferencing a helping hand.

Digital Equipment Corp. next spring will ship a video compression/decompression (codec) chip that company officials said will provide better desktop videoconferencing at a lower price than other add-in boards.

More immediately, Sprint Corp. has created Sprint Meeting Channel, a management service for large firms with several group videoconferencing systems.

Sprint will act as the single point of contact for all of a company's videoconferencing needs. The carrier will provide program management, scheduling services for multiple conference rooms and management of multipoint conferences. AT&T Corp. has a similar multipoint service.

An add-in board with Digital's 21230 chip will cost roughly $500; add-in boards with similar chips usually cost about $5,000, said Mark Kirstein, a senior analyst at In-stat, Inc. in Scottsdale, Ariz.

Speeding it up

The 21230 promises to process video data faster (see chart) and will be used in products targeting information kiosks, on-line video help in applications, training and internet-based video processing.

The use of 30 frame/sec. MPEG video processing is important to keep the screen clear from the jerky video of PCs that "drop" video frames because they can't handle the flow of data.

This is especially important for a user such as Art Chapman-Smith, president of Certified Sign Language Interpreting, Inc. in San Diego. He said he wants to use desktop videoconferencing to communicate via sign language over long distances. Right now, users have to depend on written language because they can't understand each other when signing using video.

"They want to do something visually," Chapman-Smith explained. "They want to be able to talk instead of just type."

The chips also may be used for video electronic mail. "With something like this, you can capture an MPEG file and E-mail it to your family," Kirstein said. "Everyone can become a broadcaster."

To speed up the video, the 21230 counts on the PC's CPU to perform some processing. A companion graphic chip scales the decompressed video to the correct screen size. Unlike other video-related chips, the 21230 isn't hard-wired to the Peripheral Component Interconnect bus, memory, audio or video interfaces. Users will have more flexibility when choosing peripherals, said Susan Yost, multimedia marketing manager at Digital.

Digital stacks the codec

Digital's new video codec chip adds features that promise to make applications such as videoconferencing a little easier for PC users:

- Real-time support for standard video algorithms at 30 frame/sec.
- Supports standard audio algorithms
- Takes advantage of CPU resources to speed video processing
- Includes filtering, motion estimation and scene-characterization features
- Compatible for videoconferencing over ISDN and phone lines, LANs or high-capacity WANs
- Targets users of 90-MHz Pentiums and above

Retarus Network Services has introduced MS:Link, a product for linking electronic-mail products from Lotus Development Corp. and Microsoft Corp.

According to the Munich, Germany, company, MS:Link provides a link between Lotus' CC:Mail and Microsoft's Mail E-mail products. It was designed to let users exploit the benefits of a familiar system without conversions. The product recognizes different formats and automatically converts them according to the system involved.

MS:Link is available for DOS, OS/2 and Windows NT platforms. Licenses are priced according to the number of users communicating over the gateway." Pricing starts at $1,295 for a five-user license.

▶ *Retarus Network Services*
(498) 102-7400

Janna Systems, Inc. has introduced Janna Remote.

According to the Toronto company, Janna Remote lets users access and update documents, data and workgroup scheduling information from off-site locations. It also lets mobile users synchronize new information into a central database. When an update is made to the central database, the product generates electronic mail to notify each remote user of updates.

Janna Remote's data synchronization includes conflict checking and allows for unattended operation, which lets users send new information at any time. It works with XcelleNet, Inc.'s RemoteWare, which gives remote and mobile users information access. Pricing for Janna Remote starts at $99.

▶ *Janna Systems*
(416) 483-7711

Biscom, Inc. has introduced FaxCom, a product for Lotus Development Corp.'s CC:Mail.

According to the Chelmsford, Mass., company, FaxCom lets users send and receive faxes and electronic mail through a unified user interface. It has a Windows-compliant printer driver that lets users transmit faxes directly from Windows applications.

Server software polls for new faxes, queues them and sends them to the FaxCom unit for transmission. Faxes also can be sent directly from CC:Mail.

The status of sent and received faxes is tracked by CC:Mail and the FaxCom Manager, letting users monitor fax activity.

Pricing for FaxCom starts at $2,995 and $30 per user.

▶ *Biscom*
(508) 250-1800

Latitude Communications has introduced MeetingTime for Macintosh, a version of its client software for the MeetingPlace conference server.

According to the Santa Clara, Calif., company, MeetingPlace is an audioconference server that connects to a user's telephone network and LAN or WAN. MeetingTime for Macintosh lets users schedule, monitor and control audioconferences without using a dedicated operator. Users can set up audioconferences from a Touch-Tone phone, electronic-mail system or Macintosh computer.

Before a conference, users reserve the appropriate number of ports on the server and set up options. MeetingTime includes recording and breakout session features and advanced security features that can be activated during the audioconference.

Pricing for MeetingTime for Macintosh starts at $89 per end user. Concurrent licenses cost $1,500 each.

▶ *Latitude Communications*
(408) 988-7280

InterSystems Corp. has introduced Open M, software for Windows NT environments on Digital Equipment Corp.'s Alpha systems.

According to the Boston company, Open M lets users develop client/server applications on two-tier/heavy client, two-tier/heavy server and three-tier platforms. It also allows simultaneous development in mixed client/server environments.

Open M supports enterprise data management on an OpenVMS platform, application development logic that runs under Windows NT, graphical interface development with InterSystems' Visual M and Microsoft Corp.'s Visual Basic, and development on Windows or Windows NT.

Multiuser systems start at $850. Client/server configurations start at $995.

▶ *InterSystems*
(617) 621-0600

Traffic USA, Inc. has unveiled Object-Route, a product for workgroup fax routing.

According to the Boca Raton, Fla., company, Object-Route is a Windows-based tool that routes incoming faxes to recipients through network-based electronic-mail systems. The software identifies recipients' names on cover sheets and uses the E-mail system to route faxes to the proper destination.

Pricing for Object-Route starts at $995.

▶ *Traffic USA*
(407) 995-5282

Briefs

ARDIS E-mail support

Wireless vendor ARDIS Co. in Lincolnshire, Ill., said it will support Mail on the Run, software from River Run Software Group in Greenwich, Conn. The software provides remote access to LAN-based electronic-mail systems. ARDIS users will be able to access Microsoft Corp.'s Mail and Lotus Development Corp.'s CC:Mail by using the software. They will be able to send and receive wireless messages. Mail on the Run costs $129 for a one-user pack and $800 for a five-user pack.

'Collaboratory' efforts

The Bay Area Multimedia Technology Alliance (BAMTA), a group of vendors that are dedicated to improving networked multimedia, plans to develop a test laboratory and showcase facility called the Collaboratory. The facility will provide high-bandwidth network connections, digital production studios and training areas for BAMTA members. BAMTA's headquarters is in Santa Clara, Calif.

Munchkin workstations

SunRiver Data Systems, Inc. has introduced the Munchkin X-Station, a graphical workstation that was designed for space-constrained environments such as bank teller windows and retail counters. The Munchkin X-Station's logic unit weighs just five pounds and measures 1¾ by 9¾ by 9½ in. It comes with universal access to Unix, IBM 3270, DOS and Windows applications. Munchkin X-Station starts at $1,625.

Firm ships software

SunSoft, Inc. will unveil PC-NFSpro client/server software for Windows PCs in Unix and Novell, Inc.'s NetWare enterprise networks. PC-NFSpro Version 2.0 supports Netscape Communications Corp.'s Netscape Navigator browser; TCP/IP utilities, including the file transfer protocol and Telnet; and CommTouch's Pronto electronic mail. The software starts at $349 for a single-user license and carries volume discounts for five or more copies.

Seagate expands storage repertoire

By Bob Francis

Thanks to a pair of acquisitions, disk drive manufacturer Seagate Technology, Inc. is about to graduate from the desktop to the enterprisewide storage backup market.

Seagate is adding the Arcada network backup software from Conner Peripherals, Inc. to its repertoire, alongside Palindrome Corp.'s Backup Director product. The combination gives Seagate the clout to offer a more unified storage management option for information systems managers dealing with network backup issues.

Tape backup

Arcada is geared for LANs, while Palindrome's product line includes a storage management console that can span the enterprise. However, analysts and company officials acknowledged that Seagate won't be offering a unified product line for several months.

More options

For IS managers, Arcada will increase the options for managing network backups, an increasing problem as larger and more critical applications reside on corporate networks.

The Arcada line is expected to be integrated into Palindrome's storage management console soon, said officials familiar with the Naperville, Ill., company's plans.

Seagate plans to merge its backup and storage management operations early next year.

"It's not clear how Seagate is going to handle this, but it does represent a challenge to Cheyenne," said Farid Neema, an analyst at Peripheral Concepts, Inc. in Santa Barbara, Calif.

Cheyenne Software, Inc. has long dominated the Novell, Inc. NetWare backup market with its ARCserve backup software, but the Roslyn Heights, N.Y., vendor faces rivals such IBM and EMC Corp. in mainframe backup. Cheyenne is fighting the mounting competition by striking up partnerships with key systems vendors such as Compaq Computer Corp. to offer integrated network backup offerings.

Cheyenne is beta-testing Release 6.0 of ARCserve for NetWare, which should be announced early next year, company officials said.

Other oetwork management vendors are also weighing in.

For example, McAfee Associates, Inc. in Santa Clara, Calif., recently added a standalone network backup product called ServerStor 2.0 to its line. It supports NetWare along with Banyan Systems, Inc.'s Vines, Microsoft Corp.'s Windows NT Server, Digital Equipment Corp.'s PathWorks and IBM's LAN Server.

McAfee will integrate the new product into its eoterprise systems management line early oext year. ServerStor was designed to ease management of departmental server backups and eosure data availability.

Saros to deliver secure information

CONTINUED FROM PAGE 57

designed to attach to a World Wide Web page and allow users access to documents. Users with Web browsers and proper security authorizations can then search for documents in @Mezzanine's library, Meyer said. The system stores documents in an embedded version of Microsoft Corp.'s SQL Server database

What it's about

The @Mezzanine package supports a broad range of search criteria, and its configuration can vary from simply providing the latest version of a specified document to returning a "hot list" of documents that meet the search criteria.

While his organization hasn't yet installed the beta version of @Mezzanine, Rich Duncan, manager of systems research and planning at Frank Russell Co., is already a user of Saros' AIX-based product and is seriously considering moving on to the Internet. Frank Russell is a Tacoma, Wash.-based multinational investment firm that specializes in managing pension funds.

"We very much like their [AIX-based] product, [and] we see the Web as an information dissemination tool," Duncan said.

One analyst was upbeat about @Mezzanine's future, while acknowledging that document management software has been a niche category so far.

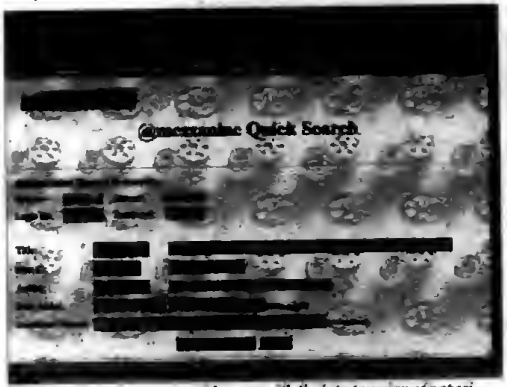
"Saros is highly regarded in the document management sector, and it's an area where Microsoft doesn't have a product," said Dwight Davis, editor of the industry newsletter "Windows Watcher" in Redmond, Wash.

Stiff competition

Davis said document management doesn't necessarily compete with workgroup products such as Notes.

In fact, a document management system can be complementary to a larger workgroup strategy, he said.

The @Mezzanine server works with Web servers that run under Windows NT and does not specifically require Microsoft's forthcoming Internet Information Server, which is due to ship in the first quarter of 1996.



Saros' @Mezzanine *can provide users with the latest version of a specified document as well as a 'hot list' of documents that meet the search criteria*

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DS Standard

CONTINUED FROM PAGE 57

NetWare 3.11 servers and consolidate them into one NetWare 4.1 server.

"DS Standard saved me at least two months of [test and configuration] time," Coleman said.

At the Department of Veteran Affairs in Sacramento, Calif., the tool saved time through its drag-and-drop capability, said Nick Brautigam, a network administrator there. He used that capability to take a snapshot of the department's NetWare 3 bindery information and then simply exported it to a NetWare 4.1 NDS format. "The GUI interface made the conversion to NDS very easy," Brautigam said.

Other DS Standard features include the following:

- The ability to let systems engineers share tree designs.
- The ability to handle modeling and migration.
- A "Verify Tree" command.
- User import support.

DS Standard can also be deployed in businesses' disaster planning and recovery procedures. By storing a known image of an NDS tree in DS Standard, users can select desired objects and configure the tree in the event any portion of the NDS tree becomes corrupted.

DS Standard Manager Version 2 is available now. A license is required for each file server. Pricing is approximately 10% of the cost of NetWare and ranges from $295 to $4,495, depending on configuration.

Brief

All together now

Adobe Systems, Inc. is teaming up with **Xionics Document Technologies, Inc.** to develop multifunction peripheral technology. The companies will use Adobe's printing technology and multifunction controllers from Xionics.

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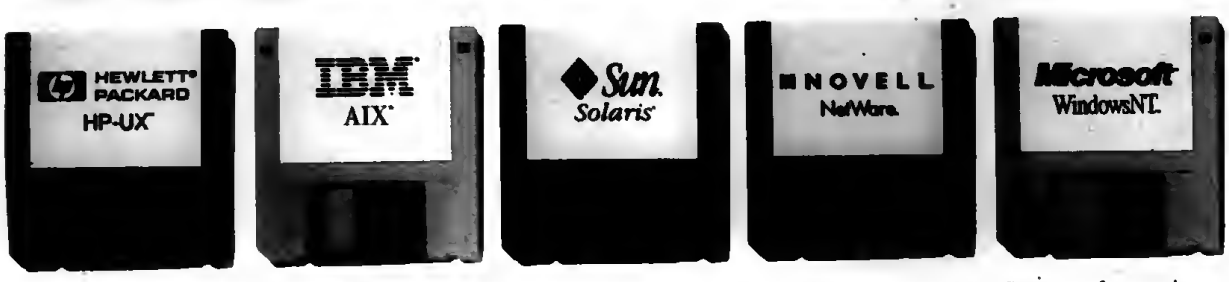

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Enterprise Networking

Software pulls the plug on games

By Patrick Dryden

Network managers have a new agent for hire. Its name is Bond, Games Bond. And it has a license to kill.

It also is known as UnGame, a tool that finds and deletes game files from server volumes and end-user hard disks in the same way other utilities attack viruses.

UnGame's distributor, DVD Software, Inc. in Irvine, Calif., just added a Windows version of the product. Users of the DOS version said it misses certain obvious games, such as one in Windows for Workgroups, but it has helped them prune game files and improve the performance of users and the network.

Bigger headache

Games may be a management headache, but the Internet poses more potential for sapping productivity, clogging storage and slowing network performance, according to Michael Howard, president of Infonetics Research, Inc.

Policy tool

"It's a convenient and relatively inexpensive way to enforce our policy against installing any software — not just games," said John Pfaff, technical support manager at ANR Advanced Transportation Co., a Milwaukee-based trucking firm.

Pfaff runs the DOS version of UnGame each night before backing up two main file servers, and each month, the user log-in scripts automatically call UnGame to examine drives at the network stations.

Union Pacific Railroad banned games two years ago after an encounter with the initial "network-unfriendly" version of Doom.

"That early version came across the WAN and locked up our network because its broadcast mode ate up so much bandwidth," said Eric Wainz, technical services manager at the railroad's 1,000-user customer service network in St. Louis.

Wainz is testing Windows and DOS versions of UnGame to find all the games at his site, even the Windows card games "because they can cause problems and use up employee time," he said.

Games present a serious threat at an Amoco Corp. manufacturing site in Texas City, Texas. Employees distracted by games could jeopardize the safety requirements of a manufacturing environment, said network administrator Tom Anderson, who runs UnGame to check the 500-user network.

"There's a fine line between being totalitarian and handing users a wide open interface," Anderson said. "We need some control, so we're not constantly in reactive mode trying to fix problems."

UnGame costs $60 per file server and works with the major network operating systems. The latest version for Windows can recognize 3,100 games.

After the shareware game Doom *locked up the network at Union Pacific Railroad, the railroad banned games*

Peter Frame

Talking over the 'net saves company cash

By Gary H. Anthes

Most Internet communications have as much privacy as a postcard.

But a number of companies are building virtual private networks (VPN) over the Internet. VPNs employ encryption and use products such as Trusted Information Systems, Inc.'s Gauntlet Internet Firewall to set up secure "tunnels" between corporate offices or between employees on the road and the home office.

The goal is to save money.

Computer Sciences Corp. (CSC) estimates that a Fortune 100 company with 20 1.5M bit/sec. private lines costing $30,000 per year each could reduce that to four lines by shifting data traffic to the Internet. That would save hundreds of thousands of dollars, although the savings would be offset partly by the cost of the encryption products and Internet access fees.

Critical data

Analysts and industry officials said security may not be the biggest obstacle to the use of Internet-based VPNs.

Private lines, *page 69*

Cisco suite helps managers keep an eye on their switches

By Bob Wallace

Cisco Systems, Inc. is working to give its users a view of their networks as well as a look at traffic reports and alarms.

CiscoWorks for Switched Internetworks, a suite of four integrated applications, will provide a complete view of a network. The suite will make it easier for users to manage networks of Cisco switches.

With a double click from an enterprise topology map, a network manager can for the first time call up a physical or logical view of switches in graphical form, change device setups and monitor the status of network components.

But Cisco's tool, like those of most competitors, has shortcomings. The bundle manages only Cisco switches and runs only on expensive Unix platforms. And not all the pieces are shipping yet.

"Users can only hope to get the lowest-common-denominator functionality from different vendors' products," said Eric Hindin, program manager at Yankee Group, Inc., a Boston consultancy.

"I'm concerned that I wouldn't have much, if any, capabilities for managing the Bay Networks switches in our network," said Bill Horst, chief at the General Services Administration's communications

Cisco, *page 69*

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Navy sails to E-mail gateway solution

By Suruchi Mohan

Managing corporate electronic mail with myriad gateways is a hair-raising experience for most administrators. But at the Naval Air Systems Command in Arlington, Va., the information systems department opted for exactly that scenario.

The Naval Air Systems Command decided to use an X.400 backbone from Digital Equipment Corp. with a number of gateways linking several existing E-mail systems.

The main reason for the change was reduced cost.

The gateway approach required "little training [and had little] impact on the users," said John Mishler, program manager of the Naval Aviation Wide Area Network. The only difference was that when a new E-mail system was integrated, the users saw new names in their mail directory.

The system worked surprisingly well and showed none of the weaknesses that plague gateways, such as truncated messages.

Electronic mail

The Naval Air Systems Command started out with six islands of E-mail: QuickMail, All-in-1, TeamLinks, CC:Mail, Microsoft Mail and WordPerfect Office.

User were unhappy with this E-mail Tower of Babel. "I had only limited E-mail capability with people on my immediate team," said Capt. Steve Fahrenkrog, a program manager for the marine light/attack helicopters in Arlington. "Other than that, it was virtually nonexistent."

With a budget of more than $17 billion a year, the Naval Air Systems Command is in charge of developing, testing and supporting all aircraft, missiles and bombs for the Navy and Marine Corps. It employs 35,000 people worldwide at 25 sites.

Yet when the organization began downsizing, the workload didn't decrease.

In the face of declining resources, Ron W. Turner, director of the information management division at the Naval Air Systems Command, opgraded the LAN at headquarters. The 3,400 people there use a mix of Macintoshes and PCs, all of which were also upgraded.

At the same time, the headquarters started to install a fiber-optic network linking the six buildings in the Arlington office complex, so people could communicate using E-mail.

To connect the users on disparate systems, Turner said he decided to go with Digital's X.400 backbone, Mailbus 400. It supports file attachments and performs directory synchronization automatically.

Each of the half-dozen mail systems now enters the Mailbus through a gateway.

The X.400 system works well across diverse hardware and operating systems, Turner said.

"Once the installation was complete, users loved it and wanted to talk to the rest of the organization. That's how the WAN project started," Mishler said.

The Naval Air Systems Command's wide-area network topology is hub-and-spoke. The East and West coasts serve as hubs, with point-to-point connections to other sites.

"The E-mail system has helped us integrate all the people together," said Capt. Joe Dyer, F/A-18 strike fighter program manager in Arlington. He said it brought about "situational awareness," a fighter-pilot term for understanding one's situation in terms of time, space, adversaries and resources. "Now we know where we are and where we're going," Dyer said.

ON SITE

Naval Air Systems Command
Arlington, Va.

Employees: 41,777; in 1995: 34,495

Budget: More than $17 billion

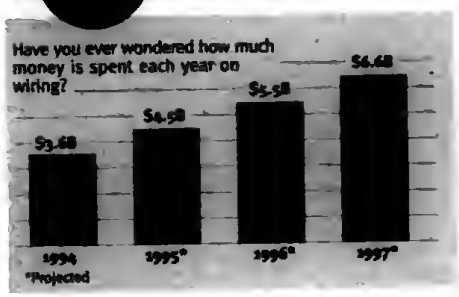
Number of aircraft: 6,511; in 1995: 4,270

E-mail systems in use: Microsoft Mail, CC:Mail, GroupWise, QuickMail, All-in-1, TeamLinks

Switch: Mailbus 400

Snapshot

In-building wiring systems revenue



Source: Frost and Sullivan, Inc., Mountain View, Calif

Briefs

X appeal

TCP/IP applications developer NetManage, Inc. in Cupertino, Calif., announced plans to acquire San Diego-based AGE Logic, Inc. The deal provides X Windows Server software so NetManage can help users connect PC and Macintosh stations to Unix-based applications over corporate internetworks.

Home Savings gets electronic banking head

Richard K. Crone, former director of KPMG Peat Marwick's Center for Electronic Banking in Los Angeles, was named senior vice president and co-director of electronic banking at Home Savings of America in Irwindale, Calif.

Madge deal gets shareholder nod

Shareholders approved Madge Networks, Inc.'s planned $300 million acquisition of Lannet, Inc. The deal, announced in June, is pending approval by regulatory groups and is expected to be completed by year's end.

Electric money

First Union Corp. in Charlotte, N.C., announced the first 12 merchants that have committed to supporting the bank's smart-card technology initiative in Atlanta, beginning in January. Domino's Pizza, Baskin-Robbins and United Artists Theatres are among the first firms to accept First Union Visa Cash next year.

Mitsubishi Electronics America, Inc. has introduced NetViper, an intelligent adapter that delivers high-speed network access to the Internet as well as to the office.

According to the Sunnyvale, Calif., company, NetViper is an Integrated Services Digital Network Industry Standard Architecture adapter.

It features plug-and-play functionality and can deliver data, voice and images. NetViper lets users download large files, browse multimedia content from the World Wide Web and transfer graphics and spreadsheets to a home office.

NetViper's onboard plug-and-play chip works in conjunction with the adapter software to automatically assign memory and configure interrupt request and I/O settings.

It also features dynamic bandwidth allocation, which allows two channels to be combined for maximum throughput of 128K bit/sec.

NetViper costs $350.

▶ *Mitsubishi Electronics America*
(408) 730-5900

StarNine Technologies, Inc. has announced WebStar/SSL Security Toolkit, a Macintosh product for enhanced World Wide Web site security.

According to the Marina del Rey, Calif., company, the tool kit gives users encryption support for creating a secure channel that prevents eavesdropping in Web connections.

It also provides server authentication for verifying the originating Web site's identity and data integrity to ensure that transmitted data arrives unaltered.

The server's authenticated Digital ID and public/private keys are designed to allow users accessing the secure site to be certain they are sending and receiving information from the correct server. In addition, all communications between the server and the browser are encrypted.

The product can be added to any Web site on the Internet or an internal corporate network.It is based on open, cross-platform standards from Netscape Communications Corp. and RSA Data Security, Inc.

WebStar/SSL Security Toolkit costs $1,295.

▶ *StarNine Technologies*
(510) 649-4949

LANcaster Synthesis Ltd. has introduced the SuperHub family of Ethernet hubs.

According to the Nashua, N.H., company, the SuperHub line features 12- and 24-port basic versions of Simple Network Management Protocol (SNMP)-ready client and master hubs. Up to five hubs can be cascaded in any combination of 12- and 24-port units to create a hub stack.

The stacks can be segmented or managed as a single unit with any management system supporting SNMP.

The SuperHubs feature a chip set that allows continuous monitoring of as many as 12 ports per hub. This lets network managers monitor and control up to 60 ports at a time on a managed stack.

Pricing for the 12-port basic unit starts at $640. The 24-port port basic unit starts at $1,060.

▶ *LANcaster Synthesis*
(603) 889-3306

Olicom USA, Inc. is shipping three new combination cards for portable computer users: GoCard TR/Modem 144, GoCard ET/Modem 288 and GoCard Modem 288. Two of the GoCards include a LAN adapter and a fax/modem.

The GoCard TR/Modem 144 is a Token Ring LAN card with a 14.4K bit/sec. modem. It costs $549.

The GoCard ET/Modem 288 is an Ethernet adapter with a 28.8K bit/sec. modem and is priced at $499. The GoCard Modem 288 is a fax/modem PC card that costs $349.

The adapters include drivers for Novell, Inc. NetWare, IBM and Microsoft Corp. network client software.

▶ *Olicom USA*
(214) 423-7560

Service firms join the Web

CONTINUED FROM PAGE 1

Next year, Grocers Insurance plans to offer policy quotes and the ability to file claims over InsWeb, an insurance industry site with 25 members that was launched last month.

Order to chaos

InsWeb was created as a way to "organize the chaos," said Darrell Ticeburst, president of Strategic Concepts Corp., the Burlingame, Calif., company that runs the site.

"With 4 million domain names out there, a search for 'insurance' on Yahoo is going to bring up a huge list," Ticeburst noted, referring to the popular Web search engine from Yahoo Corp.

With InsWeb, customers will avoid having to conduct their own company-by-company searches on the massive Web, he explained.

The site run by Grocery Manufacturers of America (GMA), meanwhile, seeks to serve a dual role as a marketing outlet and a library-like source of information.

GMA is a Washington trade association and government lobbying group for food and consumer goods firms. On its site sits a continuously updated storehouse of government regulations, pending laws and news on the grocery industry, said Dave Schroeder, coordinator of on-line services for GMA.

Reynolds Metals, a GMA member, uses GMA's site as a library for internal research. Applications on Reynolds' private Internet, or intranet, sport a button to whisk employees right to http://www.gmabrands.com.

But fear of too-close-for-comfort competition has scared off some companies from participating in industry-specific sites. Suddenly, comparison shopping is all too easy for on-line consumers. And a slightly higher price than a Web neighbor could lose a company business, said Don Jones, founder of Industry.Net, Inc., a Pittsburgh-based Web site for nuts and bolts makers, PC companies, test and measurement firms and other industrial suppliers.

Vertical industries *have begun to use the Web to build virtual shopping malls that make it easy for customers to compare prices*

A site of her own

Such raw competition made Nan Mackstaller, a Tucson, Ariz., real estate agent, opt out of the National Association of Realtors' on-line project, launched last month. She said she didn't want to be just another face in a crowd of U.S. real estate agents on the site, which lists 60,000 homes and properties for sale, in some cases from competing agents.

But Mackstaller recently established her own Web site to do much the same thing.

"It's difficult to find a particular agent within a Web site" as big as the association's, she explained. With her own site, "my home page will appear with the same strength of [the association's], and my face will be right there when someone clicks on it," she said.

Vertical leap

Types of vertical market Internet sites

Industry	Percentage of sites
Manufacturing	27%
Services	16%
Government	15%
Education	14%
Medical	8%
Finance/Insurance/Real Estate	7%
Transportation/Utilities	6%
Wholesale/Retail	5%
Agriculture/Mining/Construction	2%

Base: 4,000 Internet user sites

Source: Computer Intelligence InfoCorp, La Jolla, Calif

Charlotte's not the only Web on the farm

Responsible Agricultural Product and Information Distribution, Inc., a consortium of agricultural and chemical vendors, is scheduled to launch PowerAg on May 1.

Initially, PowerAg will give agricultural chemical makers and distributors a secure area for electronic commerce as well as access to the Internet and databases on regulatory issues.

"It's conceivable that somewhere down the road, the farmer will be able to go on-line and shop for tractor parts . . . and send out information about pests and get a response from a Third World country," said Darrin Drollinger, general manager of the Ag Electronics Association in Chicago.

— Mitch Wagner

http:

Vertical market sites, for niches from lug nuts to pet care, abound on the Web

■ Looking for insurance? Check **http://www.insweb.com**, which plans to provide information about life, health, home owners' and several other types of insurance policies offered by its 25 member companies. For now, the only insurance you can buy here is car policies for cars registered in Utah and personal watercraft protection (nationwide).

■ VetFind, at **http://www.vetfind.com/vetfind/**, helps users find veterinarians with certain specialties across the U.S. Doctors pay $120 per year to be listed.

■ A clearinghouse of information about lawyers and law firms across the U.S. can be found at the Chicago-based American Bar Association's **http://www.abanet.org**.

■ The National Association of Realtors launched **http://www.realtor.net/** last month. It's a two-pronged site: People looking to buy or sell houses can peruse listings of 60,000 properties, and real estate agents can keep up on professional news.

■ The Grocery Manufacturers of America is a trade group that lobbies the federal government for food and household products makers such as Pepsico and Procter & Gamble. Its site, at **http://www.gmabrands.com**, houses the latest USDA and other regulations and news on the grocery industry.

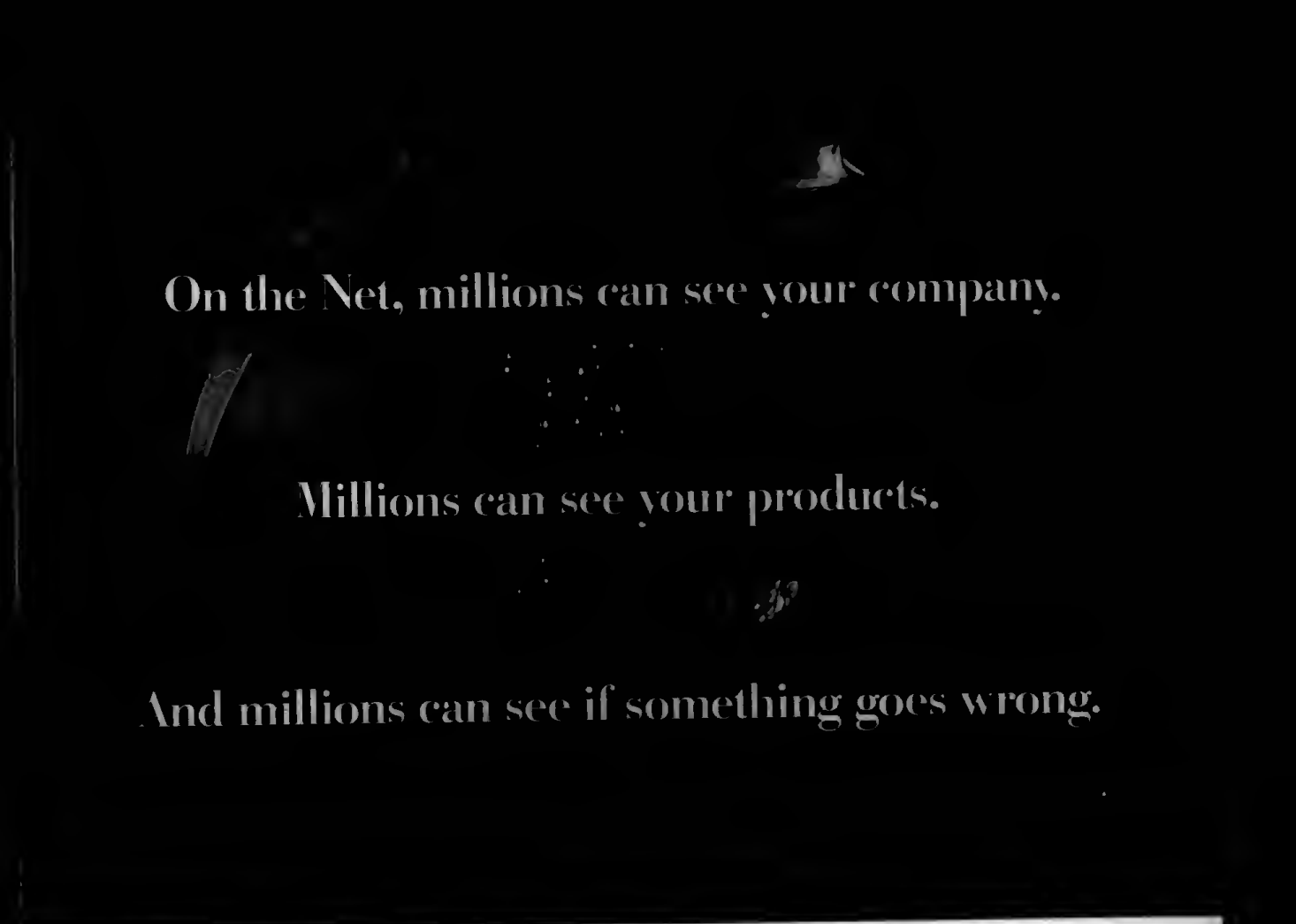
Web Page Contest!

Computerworld is soliciting your vote for the best BUSINESS home page. Please give us the address of the page and a description of why it's the best in 100 words or fewer. We will pick the best pages based on CONTENT, GRAPHICAL IMPACT and USE OF LINKS.

The person(s) nominating the winning entries will receive Quarterdeck's InternetSuite (suggested retail price of $59.95), and the top pages will be showcased with your nomination in Computerworld early next year.

For your nomination to be valid, you must be an IS professional — no vendors or consultants, please. You must also have no affiliation with the page you nominate. Please include your name, title, organization and a phone number where you can be reached.

You may nominate ONE page. Please send your nomination electronically to contest@cw.com or fax it to Lory Dix at (508) 875-8931.



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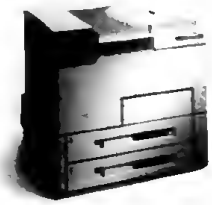
The new HP LaserJet 5Si MX network printer answers your users' questions so you won't have to.

Don't spend your day fielding questions about network printers. Instead, take a look at the HP LaserJet 5Si MX. With enhanced user software, inquiries such as "Is the printer out of toner? Out of paper?" or "Is it busy with another job?" all get answered immediately. Right from your users' desktops. Any print job – from the very simple to the very complex – can be tracked, managed, cancelled, or sent to a different printer quickly and easily. And the best thing is that you'll never hear about it. So take the intelligently simple approach to network printing. It may just free enough of your time for other important matters, starting with lunch.



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Sprint service puts different E-mail on same wavelength

By Neal Weinberg

Sprint Corp. is offering a managed service that allows a company to merge multiple, incompatible electronic-mail systems.

Sprint's InfoXchange translates messages from proprietary E-mail systems that don't speak the same language. The key pieces of InfoXchange are a universal directory, a mail hub from Cootrol Data Systems, Inc. and Sprint's fiber-optic oetwork.

Sprint's InfoXchange

Features include the following:
- Electronic messaging
- File transfer
- Electronic yellow pages
- Information management
- Document exchange
- Secure Internet gateway

Seven systems

One firm with 56,000 employees and seven different E-mail systems worldwide is taking a serious look at InfoXchange. A company spokesman, who would oot speak publicly until a cootract was signed, said the advantage of InfoXchange is that it would consolidate various E-mail systems and directories in one "global messaging system."

Tom Brennan, an analyst at TeleChoice, Inc. in Verona, N.J., said multiple E-mail systems are "fairly prevalent," especially in larger, multinational corporatioos.

Brennan said one important feature of InfoXchange is that is doesn't require companies to rip out their existing systems or make capital expenditures.

This means "no new learning curves," said Caroline Michel Robertson, an analyst at International Data Corp. in Framingham, Mass.

In addition to sending messages, InfoXchange users can call up brochures and price lists at a customer's site, and departments can share spreadsheets.

Fee structure

Sprint charges a negotiated fee to help a firm assess its E-mail needs and design the new system. Then the company pays the going rate to ride Sprint's network. And there is a fee per "kilocharacter," or 1,000 bytes. That fee is 30 cents for the first kilocharacter; 5 cents for kilocharacters 2 through 39; and 2 cents for kilocharacters beyond that.

From a strategic perspective, Sprint is playing catch-up with its larger rivals, MCI Communications Corp. and AT&T Corp., which have been rolling out value-added, managed services during the past several months.

Private lines

CONTINUED FROM PAGE 63

"Many companies are taking a go-slow approach because of the mission-critical nature of their private-line networks," said Alan Kirby, vice president of engineering at Raptor Systems, Inc., an Internet firewall and encryption vendor in Waltham, Mass. "They want to get experience with the Interoet to prove it's reliable."

Most companies could save thousands of dollars a month on data communicatioos costs by replacing leased lines with Interoet-based VPNs, said Tim Sloane, an analyst at Aberdeen Group, Inc. in Boston. The average company could put 60% of its data communications across the Internet at a savings of 40% or more, Sloane said.

Virtual private networks

Pros
- Less expensive than private telephone lines
- Flexibility to meet peak usage demands
- Can reduce network management costs
- Convenient for traveling employees

Cons
- May not be secure
- Internet service may not be reliable
- Need compatible hardware and software at each end
- Added cost of managing firewall and encryption infrastructure

Internet communications can be made quite secure using tools such as firewalls and VPN software, he said. "Internet security problems have been blown a bit out of proportion," he added.

Vicor Corp., a manufacturer in Andover, Mass., uses Raptor firewalls but has oot yet set up a VPN. Guy Wheaton, director of network marketing and operations, acknowledged that Vicor could save money with an Interoet-based VPN and do so securely.

"But performance is much more of a showstopper," Wheaton said.

Matt Mancuso, manager of network security at CSC's Secure Systems Center in Hanover, Md., said he has tested a oumber of firewall and VPN offerings oo behalf of CSC clients. He said many large companies are establishing secure networks over the public Internet.

Bob McKisson, a consultant at Cypress Systems Corp. in Fairfax, Va., said VPNs can offer relief to managers of government systems carrying "sensitive but unclassified" information. "These people are in a panic" over widely reported Internet security breaches, he said. "Now we're going to see VPN and other encryption products really take off."

Firewall fix

One issue for users is that firewall and VPN offerings tend to be proprietary. This means users largely are limited to intracompany communications. Efforts are uoder way to develop industry standards that eventually should let competing systems work together, but that woo't be possible any time soon, vendors and analysts said.

Digital Equipment Corp. recently anoounced Internet Tunnel, an encryptioo product that can be used with any firewall.

The Digital VPN product allows the establishment of "encrypted tunnels" that extend behind firewalls so communications can be secured to specific user groups inside the company.

Cisco

CONTINUED FROM PAGE 63

branch in Philadelphia. Horst said he liked that Cisco will bring all its switches under one management tool. "That's very welcome for users with dispersed networks," he said.

In comparison

Cabletron Systems, Inc.'s Spectrum network management system can run on Windows NT platforms and be used to manage internetworking gear from a variety of vendors.

CiscoWorks for Switched Internetworks includes:
- CiscoView, which draws information from a switch agent using a special protocol. It uses the Cisco Discovery Protocol, a topology discovery and mapping protocol that automatically discovers all devices in a switched internetwork.
- TrafficDirector, which pulls real-time traffic information.
- VlanDirector, which uses virtual LAN agents to give a graphical view of virtual LANs and the ability to reconfigure them.
- AtmDirector, which lets network managers create permanent virtual circuits and permanent virtual paths across an Asynchronous Transfer Mode network.

CiscoWorks for Switched Internetworks will be available on CD-ROM for Unix workstations, along with on-line documentation and help systems, in the first quarter of next year. It will be priced at $7,995.

The company will release a Windows NT versioo in mid-1996.

CiscoView and VlanDirector are available together for $2,995. TrafficDirector and AtmDirector are due in the first and second quarters of next year, respectively.

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FIDELITY FEDERAL TAKES ON TELLER MACHINES, 75

Tape it or leave it

IS says long-term storage issues may trip up organizations

By Gary H. Anthes

Some information systems management tasks get no respect.

Take long-term records storage. The subject is just a tad boring, and it's tough to drum up top management enthusiasm for something that seems to have little impact on the bottom line.

But many organizations may be headed for costly surprises if they ignore or are unaware of the technical and legal issues that govern how important records should be archived. They may end up with old tapes that can't be read, obsolete hardware, retrieval software that no longer runs and data with retention periods that fall short of user needs.

"Most organizations aren't even beginning to see the dimensions of the problem, let alone seek solutions," said William Saffady, a professor of information science and policy at the State University of New York st Albany.

Risky business

And the risks of making mistakes are increasing.

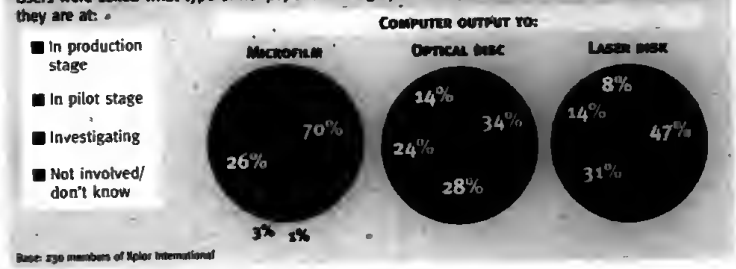
"Many organizations are going to electronic imaging instead of paper records. All of s sudden it's a disaster waiting to happen," said Donald S. Skupsky, president of Information Requirements Clearinghouse in Englewood, Colo. "Most users have not thought through two key issues: How long do we have to keep this stuff and the problem of technological obsolescence."

For the U.S. Geological Survey, the answer to the first question is easy. The agency's data, which is gathered using millions of taxpayers' dollars and stored on 100,000 magnetic tapes, must be kept forever, said computer scientist Jerry McFaul.

Storage, *page 74*

Archiving achievement

Users were asked what type of nonpaper archiving system they use and what implementation stage they are at:



Base: 230 members of Xplor International

Source: Xplor International, the Electronic Document Systems Association, Torrance, Calif.

DBMS tool meets demand

Users extol the virtues of Enterprise Manager

By Dan Richman

Users ask a lot from their relational database management systems: speed, flexibility, scalability and reliability.

But users say they really need administrative tools to centrally control their far-flung databases.

So Orac'e Corp.'s announcement last week of its Enterprise Manager was a welcome one. The free tool, which is in beta testing, was designed to administer hundreds of Oracle7 or Digital Equipment Corp. Rdb databases from s single Windows console.

Early customers said Enterprise Manager appears to administer the databases more comprehensively than similar products from other vendors.

"Enterprise Manager will be the [database administrator] Relief Act of 1996, a boon to [the administrators] and their bosses," said Peter Kastner, an analyst st Aberdeen Group, Inc. in Boston. "No other vendor has anything close to this."

'Missing link'

Tammy Lowe, assistant MIS director at Burlington Coat Factory Warehouse Corp. in Burlington, N.J., has used the product for several weeks and called it the "missing link in the database arena."

Ron Hawkins, IS director at Millipore Corp. in Bedford, Mass., said he hopes Enterprise Manager will live up to its promise. The filter

DBMS tool, *page 75*

D&B provides straight shot to client/server

By Julia King

Analysts and users give Dun & Bradstreet Software high marks for finally providing s clear-cut migration path between its mainframe-based software and distributed client/server applications announced last week [CW, Dec. 4].

But this doesn't guarantee that the company can regain s top seed in the enterprise business software market. Analysts said that will depend on how effectively D&B Software can communicate its client/server strategy in a market where the vendor noise level already is ear-splitting.

"So far, marketing has not been one of the company's strong points, so D&B has been pretty much overshadowed by its competitors in the last couple of years," said Judy Hodges, an analyst at International Data Corp. in Framingham, Mass.

To that end, D&B has spent the past eight months assembling s marketing team headed by Craig S. Richardson, a vice president at the company. The Atlanta-based vendor this month also will combine sales and marketing for its mainframe software and client/server SmartStream applications.

D&B executives said the firm's focus is on helping to make users' move from mainframe-based to client/server applications as straightforward as possible.

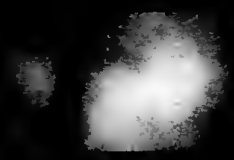
Migration tool

One way to accomplish this is via SmartStream Path, a tool that is based on technology from Evolutionary Technologies, Inc. in Houston. SmartStream Path automatically "maps sll data from mainframe data tables to SmartStream," according to Colleen A. Niven, product marketing manager at D&B Software. The process allowed one SmartStream user to convert an entire application in five days, she claimed.

But vendors such as Global Marine, Inc. in Houston, a $500 million offshore oil drilling company, have opted to write their own conversion programs. The oil company decided to change the format of its chart of accounts as part of its move to client/server technology [CW, Dec. 4].

Global Marine also would have had to pay an additional $75,000 or more for the SmartStream Path tool. "To our company, that was s significant amount of money, so we did it ourselves. In my opinion, SmartStream Path should have been part of the [price of the applications]," said Brenda Hethcoat, manager of user systems at Global Marine.

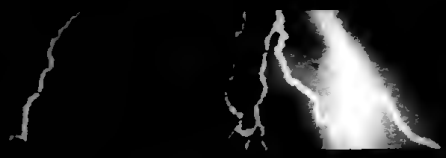
Using Information Builders, Inc.'s Focus tool on the mainframe side and Microsoft Corp.'s Access, Global programmers spent between three and four months converting code, Hethcoat said. But she said she doubts the company saved money by not buying SmartStream Path. "We probably broke even," she said.



There's a thunderstorm at 3:14 p.m.

Your power goes out at 3:17.

It's now 3:18 p.m.



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AS/400 systems ease into RISC era

By Craig Stedman

The AS/400's second life as a RISC system begins in earnest next week when the first IBM PowerPC-based models go into volume shipment.

The RISC era is starting with what amounts to a baby step, only the smallest machine will be generally available now.

The middle tier of the RISC AS/400s will follow in mid-February, and top-of-the-line Model 530s and Model 53S servers won't hit the streets until late March.

The staggered release is expected to contribute to a relatively slow migration to the RISC boxes.

AS/400 shipments actually may fall by almost 20% next year before rebounding in 1997 as RISC filters into the mainstream of the installed base, according to Gartner Group, Inc. in Stamford, Conn (see chart).

Existing customers have little reason to buy a PowerPC-based system until they hit a throughput ceiling, and bugs in an OS/400 operating system release earlier this year made some people gun-shy about being in the first wave of RISC pioneers, analysts said.

RISC rollout

By the end of 1997, about 25% of the AS/400s installed at customer sites will be RISC models, predicted Tom Bittman, an analyst at Gartner Group in Stamford, Conn.

Easy switch

Several beta testers using the low-end machines said the switch to a RISC version of OS/400 is mostly painless.

As promised by IBM, their key applications are converting almost automatically from installed 48-bit AS/400s to the 64-bit hardware and operating system.

But that doesn't always apply to the software utilities needed to run jobs such as forms printing, electronic data interchange and database cross-referencing.

"Some vendors are being really sticky about giving us new code" that will enable their utilities to run on the RISC machines, said Joe Voloshin, systems manager at Adventist Health System West.

The hospital chain in Roseville, Calif., doesn't expect its forms printing tool to be RISC-ready for as much as two months, he added.

As a result, Adventist still prints forms on its old E50 machine rather than on the Model 50S RISC server that last month took over the rest of its corporate processing.

To get off the E50, the company may do an interim workaround that would move the printing to one of IBM's portable AS/400s, Voloshin said.

Software glitch

To make their tools RISC-compatible, software vendors have to rewrite a "non-observable" batch of security code that ensures programs are being used on the proper machines.

"Not all the [utility] products are there yet," agreed Dale Simpson, manager of information services at the LDS Foundation in Provo, Utah.

But when it comes to performance, the beta testers were all smiles.

Simpson said the LDS Foundation, which handles alumni fundraising for Brigham Young University and affiliated colleges, saw one database query go from a 16-hour job on its E50 to less than an hour on a 50S.

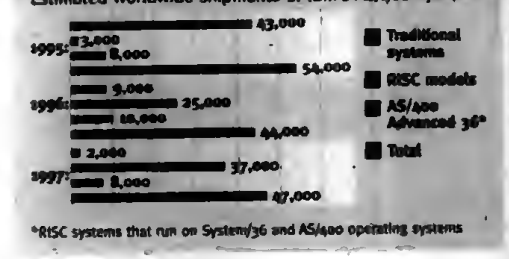
At Adventist, a simple query of its 8.8 million-record database ran four times faster on the 50S, Voloshin said.

A more complex query with file joins and other compute-intensive tasks was cut from eight hours to about 30 minutes.

The RISC hardware "seems to really fly compared to what we had before," he noted.

Winds of change

Estimated worldwide shipments of IBM's AS/400 systems



*RISC systems that run on System/36 and AS/400 operating systems

Source: Gartner Group, Inc., Stamford, Conn.

Storage

CONTINUED FROM PAGE 71

Unfortunately, tapes aren't forever. McFaul said he converted seismic data on 640 open-reel tapes to 39 recordable compact discs (CD-R). Even though he cleaned the heads of the tape drive after every tape was copied, more than 10% of the tapes produced read errors, some of them unrecoverable. And those tapes were less than 10 years old.

But the CDs — which also are in use at a few other federal agencies with big tape archives, such as NASA — should last a good long time, McFaul said Eastman Kodak Co. has run "credible" benchmarks that project a 217-year shelf life for CDs.

But CDs aren't the answer for everyone, at least not yet. The National Archives and Records Administration has 14,800 tapes; many of them are the old, open-reel, 9-track type.

Data archiving

The archive organization gradually is copying those to IBM 3480 cartridge tapes and will eventually copy the data again to newer 3490 tapes, said Fynnette Eaton, chief of technical services at the archives' Center for Electronic Records.

Eaton said the risk-averse archives decided not to use CDs because the technology is new.

She also said databases on the random-access CDs normally include software for data compression, retrieval and display. That is a great convenience for users but could present problems if that software won't run under a future operating system, she said.

Con Edison Co. in New York is rapidly moving away from paper processing and storage by scanning and discarding important documents shortly after they come in the door. Ed Glister, a senior project manager at the utility, acknowledged the risks in electronic archives, but he said paper is worse.

"We have had some unfortunate problems in the paper world, we have found it often is not retrievable when you need it," Glister said. "There's a comfort level with paper that is undeserved."

Con Edison has established a hierarchy of storage media; key data migrates from on-line disks to optical discs to CD-ROM over time. Some data, such as customer contracts, must be kept for decades, Glister said.

American President Lines Ltd. in Oakland, Calif., recently moved directly from paper storage to optical discs.

The international shipping firm scanned in about 8 million documents that had been stored in offices around the world, said Loretta Goralczyk, imaging manager. The discs can be used for at least 30 years, and there are several ways to convert them to new media as technology changes, she said.

McFaul has become a crusader in government circles for the adoption of CD-R and CD-ROM to replace millions of aging magnetic tapes.

"The government has billions of dollars tied up in its data collections," he said. "We have a sleeping giant, and the giant is going to be annoyed when he wakes up to find we are not preserving this priceless data."

To dump or not to dump?

Organizations shouldn't store data forever just because they can, said Donald S. Skupsky, president of Information Requirements Clearinghouse.

"There are almost no legal requirements for permanent storage of tax, accounting or employment records," he noted.

For example, even if an employee has been on the payroll for decades, only six years of history needs to be maintained to compute pension benefits, Skupsky said.

Excessive storage is expensive and may add exposure to lawsuits. "No matter what the legal requirements for records retention, if you have records when litigation begins, you may not destroy them," Skupsky said.

But William Saffady, a professor of information science and policy at the State University of New York at Albany, rejects the minimalist approach to archiving.

He argues for "permanent retention cycles" for many records. "There is a substantial number of business records where we cannot foresee a time when we could discard them," he said.

Saffady said lawyers may urge short retention cycles, but users will demand longer ones. — *Gary H. Anthes*

[redacted]

OpenVision Technologies, Inc. has introduced OpenV NetBackup 2.0.

According to the Pleasanton, Calif., company, OpenV NetBackup 2.0 is a mainframe-class enterprise storage product that provides backup, restore and archive services for Unix, Windows NT and desktop systems.

It features a parallel backup capability that improves the performance of local backup or backups across the network by streaming multiple backup sessions to a single tape drive.

Parallel backup was designed to eliminate the need for a tape drive to be available for each backup session.

The product also can perform hot database backups for Oracle Corp., Sybase, Inc. and Informix Corp. databases.

The OpenV NetBackup 2.0 server costs $5,500. Pricing for clients starts at $150.

▶ *OpenVision Technologies (510) 426-6400*

Apptied Management Systems, Inc. has introduced PowerPlains, a Windows version of Great Plains Software, Inc.'s Great Plains Accounting (GPA).

According to the Branford, Conn., company, PowerPlains migrates existing Great Plains data into a Windows environment and provides a graphical version of the GPA feature set.

PowerPlains modules start at $295.

▶ *Applied Management Systems (203) 488-4775*

Fidelity Federal takes on teller machines

Bank hires start-up vendor to improve operations

By Thomas Hoffman

Faced with the annual loss of $50,000 from its automated teller machines, Fidelity Federal Bank F.S.B. went looking for a new third-party transaction processing vendor.

The Glendale, Calif.-based thrift wanted to stanch the flow of lost dollars and move its automated teller machines (ATM) from batch mode to on-line processing. The move was fueled by the bank's expansion from three to 33 ATMs in 1994.

Under the batch-oriented ATM processing arrangement it was possible, for example, for a Fidelity Federal customer to withdraw $500 from an ATM and then remove the same amount of cash from another branch.

Yet the bank would record only one of the transactions, explained Ken Stauffer, senior vice president and chief information officer at Fidelity Federal.

In choosing an electronic funds transfer vendor, Fidelity bypassed traditional stalwarts such as Fiserv, Inc. and EDS Corp. It settled instead on start-up U.S. Processing, Inc. in Brown Deer, Wis.

"We felt that a smaller upstart might provide us better service and keep us from being lost in a sea of bigger fish," Stauffer said.

Fidelity Federal's *Ken Stauffer says outsourcing will save the firm $890,000 over five years*

Fidelity Federal last month began processing its ATM operations on U.S. Processing's Tandem Computers, Inc. Himalaya K1000 machine running Applied Communications, Inc.'s Base24 and U.S. Software, Inc.'s Trans24 transaction processing systems.

Of course, it didn't hurt U.S. Processing's cause when its bid for the five-year contract was 8% lower than its nearest rival, added Lois Peck, senior vice president of retail operations at Fidelity Federal.

Stauffer said he expects Fidelity Federal to recapture its outsourcing investment after 18 months and save $890,000 during the five-year agreement.

Fidelity Federal's *Lois Peck says U.S. Processing helped itself by offering the lowest bid among vendors*

Those savings will include information systems costs, end-user support costs and the elimination of losses from its ATM operations.

U.S. Processing entered the electronic funds transfer market at a good time. Even though 88% of all U.S. financial institutions already use a third-party processor for ATM transactions, no player owns more than an 11% share of the market, according to Mentis Corp., a bank industry research firm in Research Triangle Park, N.C.

On-line electronic commerce is taking shape while consumers are increasing their reliance on credit and debit cards.

DBMS tool

CONTINUED FROM PAGE 71

manufacturer has 30 sites in five countries; they all run Oracle databases. Managing them with one tool "is an absolute necessity," Hawkins said.

"This is a hard problem to solve, but from what I've heard, Oracle is on the right track," he said. Millipore isn't taking part in the product's beta testing, however.

Enterprise Manager, which will run under Windows 95 and Windows NT, will be bundled with Oracle7.3, which ships in April. It also will work with all versions of Oracle7.

The graphical tool can add or remove users, change privileges and perform backups and tune-ups on "many hundreds" of Oracle seats, said Mark Jarvis, Oracle's senior director of server marketing. The changes can be performed using simple commands, he said.

The software can manage the complex process of loading client/server software from a single console to all servers. It also can analyze applications that are performing poorly, suggest improvements and implement them with the database administrator's approval. The software can be launched from inside systems management tools such as IBM's NetView/6000 or Hewlett-Packard Co.'s OpenView.

Oracle built the product on its SQL Net networking software rather than follow the strategy of rivals Sybase, Inc. and Informix Corp. Those vendors based similar products on the Tivoli Management Framework from Tivoli Systems, Inc. in Austin, Texas.

Enterprise Manager offers more built-in capabilities than competing products from Sybase, Informix or Computer Associates International, Inc. For example, Sybase's product requires a $150-per-user option to distribute software. CA's requires the presence of a different product, UniCenter. That product costs at least $2,000.

Running the show

Major relational DBMS vendors' enterprisewide products include the following:

Vendor: Oracle, Redwood Shores, Calif.
Product name: Oracle Enterprise Manager
Availability: With Oracle7.3, by April 1
Cost: Free with Oracle7.3

Vendor: Sybase, Emeryville, Calif.
Product name: Enterprise SQL Server Manager
Availability: Now
Cost: $900-$33,000, depending on number of users and servers

Vendor: Informix Software, Menlo Park, Calif.
Product name: Enterprise Command Center
Availability: By July 1 for XPS (for symmetric multiprocessing clusters and massively parallel machines); by Jan. 1, 1997, for OnLine (for all other machines)
Cost: Not yet set

Vendor: Computer Associates International, Islandia, N.Y.
Product name: Visual DBA
Availability: Now
Cost: Free with Openingres 1.1

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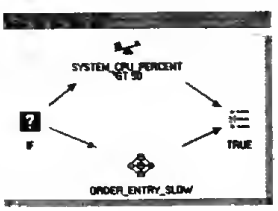
Using the lessons of client/server, the Candle Command Center architecture distributes systems management functionality across three components: Candle Management Server,™ Candle Management Workstation™ and OMEGAMON® Monitoring Agents.



Advanced Technology

The Candle Command Center solutions are built on Candle Technologies™ (CT™) a unique object-oriented framework. Among the features of this advanced technology, CT enables

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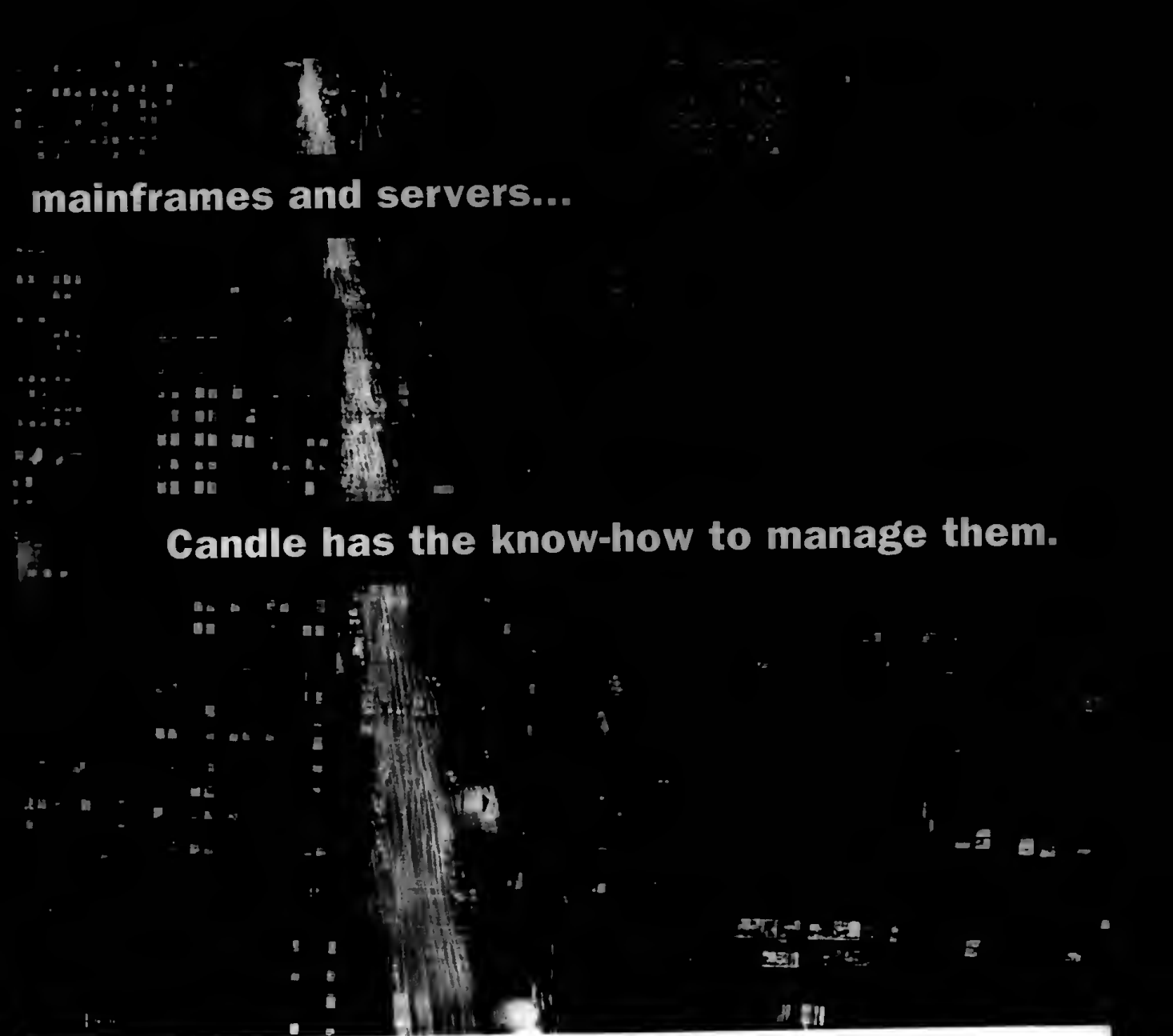

the fusion of Visual Programming with local or distributed inference engines for enterprise alert management.

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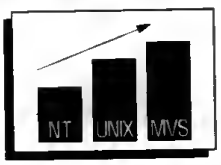

To meet that commitment, we are testing our solutions on one of the world's largest UNIX machines—a 512-node SP2. Even the Candle Management Server itself can be scaled with hub versions available for MVS, AIX and Windows NT.

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NEW PRODUCTS, 85

Application Development

CASE • LANGUAGES • TOOLS

Spicing up Java

New products designed to boost enterprise capability

By Frank Hayes

Is Java the way to go for enterprise development? Corporate developers coosidering Sun Microsystems, Inc.'s forthcoming Internet applications language say Java is hot stuff. But by itself, it isn't strong enough for the enterprise.

"It's amazing how fast we've all figured out Java's a great thing," said Art Clancy, a consultant and project manager at Merrill Lynch & Co. in New York. "But without using a more robust infrastructure, you can't raise a Java application to the level of the enterprise."

Internet applications

Java applications are stored on a central server and downloaded only as needed. Users can download and run a Java program using any Java-enabled World Wide Web browser, and the same application can run unchanged on a PC, Macintosh or Unix-based workstation.

Applications stored on a central server instead of hundreds or thousands of PCs are much easier to manage, according to Kent Podvin He is director of information systems strategic planning and re-engineering at Rite Aid Corp., a drugstore chain based in Camp Hill, Pa. "Otherwise, managing all the components in a client/server system and keeping them all in sync gets to be a nightmare," he said.

But enterprise-scale distributed applications need secure, reliable access to enterprise data, which is a lot more robust than a simple link between a browser and Web site.

Hoping to bring those connections to enterprise strength, high-end middleware vendors are building links between Java and popular enterprise infrastructures.

PostModern Computing Technologies, Inc. in Mountain View, Calif., this week plans to announce a system for connecting Java programs to object-oriented communications systems.

Black Widow coming

PostModern's product, code-named Black Widow, lets developers build Java programs that communicate using the Object Management Group's Common Object Request Broker Architecture (CORBA). CORBA is used in IBM's OS/2 and mainframe MVS and by most major Unix vendors. CORBA implementations from different vendors can interconnect.

Java's World Wide Web *home page is a hot link for Internet application developers*

Black Widow generates Java code for developers to include in Java applications so they can create secure object-based connections with enterprise systems and data.

The tool is scheduled to ship in the second quarter next year. It will cost $995.

"It's really a lot easier to maintain a server using CORBA, and the ease of adding those pieces into Java is amazing," Clancy said. He is testing the system for Merrill Lynch.

New middleware

Open Environment Corp. last week also announced a version of its Entera middleware that will let Java applications link with a wide range of legacy systems, applications and databases.

The Boston-based vendor's Entera Internet Launcher is slated to ship in the first half of next year.

With Entera, developers can build applications that use a Java program as a front end.

The front end connects to mainframes, client/server applications and other enterprise services through a secure and reliable communications system, using TCP/IP or the Open Software Foundation's Distributed Computing Environment.

Corporate development puzzle: buy vs. build

Linked and integrated tool systems add to list of options

By Frank Hayes

Why develop applications yourself if you can buy them? That is the question many corporate development shops face.

Off-the-shelf software isn't limited to desktop word processors and spreadsheets.

Even high-end enterprise systems fall into the category of buyable systems. In some industries, prepackaged systems such as R/3 from SAP AG in Walldorf, Germany, have almost entirely replaced manufacturing resource planning systems that once would have been built and maintained in-house.

PeopleSoft, Inc. in Walnut Creek, Calif., has gained a similar foothold in human resources systems.

"At one time there was a view that if you did it yourself, you'd have a proprietary advantage," said James H. Nisbet, corporate vice president of information technology at Monsanto Co. in St. Louis.

But many of those efforts didn't pay off compared to the high cost of development, he said. Packaged products are the way to go for many systems, he said.

Buy or build?

Different approaches let high-end application developers trade simplicity for flexibility

APPROACH	TYPICAL TECHNOLOGY
Buy a complete high-end system and then configure it	SAP AG
Buy a component-based system for major reconfiguration	PeopleSoft, System Software Associates
Buy major components, then glue together using a high-end development system	Seer
Buy or build components, then stitch together with legacy systems	DCE, CORBA
Build from scratch	Cobol, C, Visual Basic, PowerBuilder

Mostly mixed

Most corporate applications still can't be purchased off the shelf — they require a mix of packaged software and custom development.

And to simplify that mix-and-match approach, high-end development tool vendors are linking their tool sets to packaged products.

Longtime high-end development leader Texas Instruments, Inc. in Plano, Texas, has spent the last two years converting its Information Engineering Facility, a mainframe development environment, into Composer, a client/server environment for building applications from components that use Microsoft Corp.'s OLE architecture.

Applications developed using Composer can be linked to conventional Windows-based desktop software.

And Seer Technologies, Inc. in Cary, N.C., last mouth announced it will integrate its Seer HPS development system with Microsoft's BackOffice suite of applications that run on Windows NT.

Seer and Microsoft officials say they hope developers will be able to use the prepackaged BackOffice applications to replace large amounts of code that information systems shops otherwise would have to write themselves.

Simplicity vs. flexibility

Users say the buy-vs.-build decision is less a choice than a trade-off between simplicity and flexibility.

Even with packaged applications such as SAP's R/3, "you have to configure it based on what you want to do," said Cinda Hallman, vice president of information systems at Du Pont Co. in Wilmington, Del. Other approaches on the buy-vs.-build spectrum include the following:

- Buy a component-based system that can be more dramatically reconfigured. PeopleSoft's human resources system was designed to include components that can be reassembled in different ways. A forthcoming manufacturing system from Chicago-based System Software Associates, Inc. is being designed in the same way.
- Buy major components, then use a high-end development system to glue them together.
- Buy or build components, then stitch them together with legacy systems using middleware. That middleware may include the Open Software Foundation's Distributed Computing Environmeot or object systems that conform to the Object Management Group's Common Object Request Broker Architecture.
- Build the system from scratch using languages such as Cobol and C, and visual development tools such as Microsoft's Visual Basic and Powersoft Corp.'s PowerBuilder.

Stewart McKie

Components are here now

"Who needs objects?" an impertinent columnist asked recently [CW, Nov. 13].

She focused on application suites as an example of why objects won't fly, but application suites and application objects have very little to do with one another.

The columnist was right to say that suites aren't good component software. But she was wrong to say that component software is years away. Suites, in fact, provide a good example of how that software will work.

The difference between suites and real component software is simply one of granularity. Microsoft's Office suite can be viewed as a framework with five components: Word, Excel, Access, Powerpoint and Mail. Yes, these components are really applications. Nevertheless, they are components, albeit at a coarse level of granularity. Through OLE, I can access other components — Visio is linked to Word, Total Access Speller to Access and Instant Multimedia to Powerpoint. So components aren't only here, but they actually work and add value in suites.

The writer also claims that no distribution network exists for components, but it does. CD-ROMs and the Internet are ideal for distributing components, though it means a shift in distribution strategies that eliminates the current middleman structure. Every major vendor is looking at this issue. Eventually, one will develop software distributed as components.

Many people associate component software with technical things such as Visual Basic and OLE controls, tools that programmers use to assemble applications. But I've got news for you: The real action in component software lies in accounting applications.

Software 2000 has built its client/server applications using accounts, employees and so on as discrete business objects. Dun & Bradstreet Software has decomposed its enterprise application suite into hundreds of discrete activities that can be reassembled through its workflow engine. Navision Software sells its accounting application not in modules but in granules, individual software components that its resellers assemble for customers.

The breakdown of applications into business objects is where the real value of the component approach to software design can be found. Workflow provides the technology glue to meld business object components in myriad ways and to model business practices now and adapt to future changes. Suites are the dinosaurs of component technology. Granular business objects, which you can buy and use now, are the cyberapplications of the future.

McKie is a financial software consultant in Redmond, Wash., and editor of the "CGO/Info" newsletter. He can be reached at 74660.3123@compuserve.com.

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Brief

ClientSoft extends reach

ClientSoft, Inc. has announced ClientBuilder 4.5, a middleware tool kit that lets users extend legacy applications into client/server environments. The Tarrytown, N.Y., vendor said its open architecture was designed to help integrate legacy applications with development tool kits, including Microsoft Corp.'s Visual Basic and Powersoft Corp.'s PowerBuilder. The kit costs $12,795.

Purina Mills Satisfies Data-Hungry Decision Makers with the SAS® System

Every business day, information managers at Purina Mills—America's leader in animal nutrition—satisfy a different kind of craving: the need of top executives to get their hands on strategic information to support better quality decisions.

Luckily, they've cut preparation time substantially since adding SAS software to their menu of productivity tools. "Comparing the SAS System to anything else we've ever used to analyze business data, I'd say SAS software is by far the best," says Gerry Daignault, Region Controller. "There was a time when we had to do things manually. But today, we can review many aspects of our business just by pointing and clicking."

Purina Mills relied on the SAS System to build client/server applications now in use by field representatives and managers at specific manufacturing locations. Daignault adds that "SAS software is so simple to use that even those managers and executives who have not previously used computers feel right at home."

Feeding Decisions at Every Level

According to Mike Durbin, Supervisor of Information Services for Purina Mills, his department needs to get information to managers as quickly as possible, who in turn must deliver relevant details to upper management as quickly as possible.

"We use SAS software in many areas of operation including budgeting, research, and as a management support tool," says Durbin. "Activities include tracking customer volume, current income, and comparative analyses of income year-by-year."

Daignault, Brown, Durbin

Serving Up the Right Information... at the Right Time

Connie Brown, Purina Mills Information Analyst, says the key business benefits of using the SAS System are "improved productivity by key field management and a consistent thought process in the use of management information. There is no question that field management spends less time gathering numbers and more time using good information to support the decision process. Mapping and graphical presentations are becoming more important in the decision process, and SAS Institute has been very supportive in helping us implement these tools."

"SAS software is doing the job for us," Daignault concludes. "All of our directors will eventually have it available."

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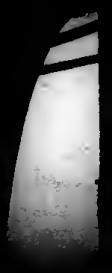

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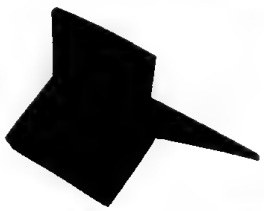

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Of course, there's more to this notebook than long battery life. The XPi's active matrix SVGA color screen can display up to 50 percent more information at up to 800x600 resolution. Along with 16MB of RAM and a 1.2GB hard drive, it helps you get the most out of every minute of the battery's power.

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Briefs

Magic shuffles deck

Hoping to kick its U.S. operation into high gear, Magic Software Enterprises, Inc. in Irvine, Calif., has replaced its management team. The company's namesake application development system has been successful in Europe and Asia, but in the U.S., it lags behind competitors such as Powersoft Corp.'s PowerBuilder and Gupta Corp.'s SQLWindows. Uzi Yair, former president and CEO of Liant Software Corp., has taken over as the firm's CEO. Jeffrey Starr, former marketing vice president at the company's Israeli parent Magic Software Enterprises Ltd., will have the same job at the U.S. subsidiary.

PostModern objects

PostModern Computing Technologies, Inc. in Mountain View, Calif., recently rolled out a new version of its ORBeline object-communications system. ORBeline 2.0 now supports Microsoft Corp.'s OLE object architecture as well as the Object Management Group's Common Object Request Broker Architecture, which is used by IBM and major Unix vendors. ORBeline 2.0 on Windows 95 and Windows NT costs $2,995, with a $150 runtime fee; Unix versions cost $4,995, with a $250 runtime fee.

DEC, Macromedia team up

Digital Equipment Corp. and Macromedia, Inc. early next year will bundle their multimedia authoring software, allowing users to create multimedia applications that can be deployed on PCs and the World Wide Web and over interactive broadband networks. Prices for the Mediaplex Application Development System start at $33,900.

Virtual reality design

Division, Inc. in Chapel Hill, N.C., presented the first multiuser virtual reality demonstration using its authoring software at VR World '95 last month in Boston. Two participants, located in Boston and London, were able to communicate over phone lines and hand objects back and forth in a design and engineering simulation.

Geoworks releases tools

Geoworks, Inc. released two tools to help developers build applications for Hewlett-Packard Co.'s OmniGo 100, a handheld organizer that uses the Geos operating system. The $99 Geos Software Development Kit includes a compiler, linker, debugger and specific tools for OmniGo 100. Geoworks Bindery 2.0 allows developers to build "electronic books" for the handheld organizer. The $99 tool costs $29 through Jan. 31.

Gupta looks for a few good connections

Gupta Corp. in Menlo Park, Calif., said it has cut a deal to hook its SQLWindows visual development system up to Open Environment Corp.'s Entera middleware.

"If I can do distributed development in SQLWindows without having to reinvent the wheel, that's what I prefer," said Bill Dunn, president of Dunn Systems, Inc., a consulting firm in Lincolnwood, Ill.

Starting immediately, developers can buy a $595 SQLWindows component called QuickRPC from Open Environment in Boston. Developers can drag the QuickRPC component into an SQLWindows application and connect it directly to enterprise relational databases and transaction monitors as well as other applications that have been Entera-enabled.

Entera also will form the infrastructure for Gupta's next-generation version of SQLWindows, Centura, which will support distributed applications. Centura is scheduled to ship in the first quarter of 1996.

— Frank Hayes

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[redacted]

Gimpel Software Corp. has introduced PC-lint 7.0 for C++.

According to the Collegeville, Pa., company, PC-lint 7.0 for C++ analyzes mixed suites of C and C++ programs and reports on bugs, glitches and inconsistencies. The product features interstatement value tracking, which assigns values to auto variables and data members, retaining this information across statement boundaries. It also scrutinizes macros.

PC-lint 7.0 for C++ features the following types of checking processes: strong type, loss of precision, unaccessed variables, unused program components and Boolean. It includes control-flow-based analysis and variable initialization.

PC-lint is compatible with all major C/C++ compilers and their application frameworks. It includes a Windows 95/Windows NT executable. Pricing starts at $239.

▶ *Gimpel Software*
(610) 584-4261

RAD Technologies, Inc. has introduced PowerMedia, an open systems authoring tool.

The Palo Alto, Calif., company said PowerMedia is a multimedia authoring and delivery tool for World Wide Web developers that provides advanced graphics, interactivity and multimedia support. It allows delivery over the Internet and client/server networks across most major platforms.

The tool was designed to add on-line multimedia capabilities to Netscape Communications Corp.'s Navigator and increase Navigator's capabilities in sales, marketing and training over enterprise networks and the Internet.

PowerMedia costs $2,500.

▶ *RAD Technologies*
(415) 617-9430

SQA, Inc. has introduced SQA Manager 4.0, an application analyzer.

According to the Woburn, Mass., company, SQA Manager 4.0 lets users plan, manage and analyze the testing of enterprise Windows client/server applications. It includes an electronic-mail-enabled workflow model to allow enterprise management of automated testing and defect tracking. As a defect is entered or changed, the product automatically sends E-mail messages to recipients on the network running a Messaging Application Programming Interface-compliant E-mail system.

SQA Manager generates test requirements and procedures for Powersoft Corp. PowerBuilder applications directly from source code. It features an open repository that lets users import and export test requirements to and from external text files.

SQA Manager 4.0 costs $1,295 per seat.

▶ *SQA*
(617) 939-3000

NetManage, Inc. has announced Chameleon Internet Software Developer's Kit.

According to the Cupertino, Calif., company, Chameleon Internet Software Developer's Kit lets developers use standard Internet technologies to build customized business products. The products are used in corporate internal networks running on top of Windows NT and Windows 95. Users can build custom applications using basic Internet technologies, including the World Wide Web, Telnet, file transfer protocol, Simple Mail Transfer Protocol-based electronic mail and news servers.

The product has a set of OLE controls, including WinSock; Secure Sockets Layer for user authentication; HTML 2.0+, a tool for making Hypertext Markup Language (HTML) extensions; and client and server Hypertext Transport Protocol for using Web technology. The controls let users build applications such as customer support systems and sales management.

Pricing for Chameleon Internet Software Developer's Kit starts at $400.

▶ *NetManage*
(408) 973-7171

Product short

Wilson Window Ware, Inc. has introduced WinBatch 95, a batch language for systems control. Users can add batch-script menus to the Windows 95 Taskbar and Explorer. WinBatch 95 also can be used to automate software management. Cost: $100 for a single user. Wilson Window Ware, Seattle, Wash. (206) 938-1740.

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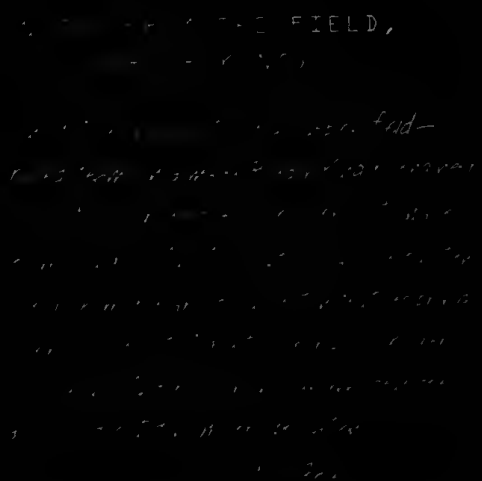

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Managing

Buried Alive!

ILLUSTRATIONS BY DAVID CLARK

Our chief information officer gave the go-ahead to hire nine contract workers. My director told me I would be doing the recruiting. Well, 125 resumes, 60 interviews, 20 agencies and 10 weeks later, I'm still not done.

By Brian D. Jaffe

I guess the director of my department figures I can find nine contractors during those quiet times when I'm not doing my regular job as client services manager.

I have several openings for long-term contractors in our New York and Connecticut offices. I need desktop software specialists, network engineers, a Novell, Inc.-Certified NetWare Engineer, a LAN administrator, a Notes engineer and someone to help process user requests. I deal with recruitment agencies, screen resumes from job candidates and do initial interviews. If candidates pass muster, I send them along to their potential bosses for in-depth technical interviews.

It always costs more than you think

Telecommuting and client/server eventually may save money, but IS managers find that new expenses lurk behind new technologies

Bad news. According to a study by Forrester Research, Inc. in Cambridge, Mass., retraining information systems workers is far from cheap. Forrester estimates that it costs $30,000 to $45,000 a head to take employees in a host-computing environment and get them up to speed on client/server skills. That breaks down to $10,000 to $15,000 in actual training fees and — ouch — another 20 to 30 grand in lost productivity as the employees struggle to master the new technology.

Worse news. After all that money is spent, 30% to 50% of the host-computing folks can't cut the mustard anyway, according to the same study.

Internet Sites for IS Managers

See page 93

I get in touch with agencies I've dealt with in the past and stop blowing off the cold calls I get regularly. The fax machine starts humming. By the end of the week, I've scheduled 13 interviews in two days. Exhausted, I hire one of the desktop specialists I need. **One down, eight to go.**

I interview one candidate who tells me Borland International, Inc.'s MultiMate is a memory manager and pass on another with purple hair. I bring in a second desktop specialist for New York and find someone who looks good for a similar position in Connecticut. I send the candidate for the Connecticut job on for a second interview, despite his somewhat overpowering cologne. **Two down, seven to go.**

My name is out on the street. I'm getting calls from new agencies every day. Apparently, candidates I've spoken to are passing my name on. I spend time refining my description of the positions and my requirements for the recruiters. While I draw a distinction between a LAN administrator and a Novell NetWare engineer, many recruiters who call me see only synonyms.

The people in Connecticut like the guy I sent them despite his cologne. I also hire the clerical individual. His manager is ecstatic. **Four down, five to go.**

The department secretary shows me how to change the toner cartridge in our fax machine. For better or worse, I'm beginning to make decisions before I ask my first interview question. I meet a candidate for the Novell position who gives me a perfect explanation of RAID-5 but adds that if you have only three drives, it is RAID-3. I've started asking candidates for the network position what function the TCP/IP subnet mask performs. A lot of them are amazed they have no idea what it does. I hire a Notes engineer and a LAN administrator. **Six down, three to go.**

An in-house NetWare engineer is having second thoughts about the Notes engineer. I say I'll keep an eye on him. I'm on the fence with several people, and as I pass them on for second interviews, they are rejected. Due to varying techniques and styles, each interview yields different information. Some candidates meet with as many as six people. Afterward, we get together and discuss them. As a group, we're more critical than we are as individuals. As a result, no hires this week. **Still six down and three to go.**

The Notes engineer we aren't sure about says he needs time off because of a family emergency. My instincts tell me something is amiss. I tell the agencies to consider the position open again. **Losing ground now; five down, four to go.**

I am right. The Notes engineer doesn't return or call, and his recruiter can't reach him either. On the plus side, I bring in the network engineer I was looking for. A candidate I like calls to ask more questions. Her need to check with me to be sure about the job actually reassures both of us and makes me eager for her to say yes. For the first time in weeks, I feel better. But she decides to go elsewhere. I know that it'll be on my mind for a long time. **Six down, three to go.**

The folks in Connecticut are getting anxious; I've found only one person for them. Part of the problem is recruiters who don't fully explain the position to the candidates. More than once, I've gotten blank stares when I tell a New Yorker they are interviewing for a position in another state.

This week, I meet someone who rede-

Buried alive, *page 92*

And while you've got your checkbook out, set aside an extra $1.6 million. That's how much the average company wastes each year on hidden costs incurred by telecommuters and road warriors.

A study by Infonetics Research, Inc. in San Jose, Calif., found that organizations spent an average of $4.79 million annually on remote access. Of that amount, 50% went to recurring operations costs, while a whopping 35% (the $1.6 million figure) went down the drain as frustrated workers configured or repaired their own equipment. And only the remaining 15% was spent on acquisition.

F.Y.I., *page 92*

1995 remote access costs

SOURCE: Infonetics Research, Inc., San Jose, Calif. Survey of purchase decision-makers at 161 organizations that use remote access networks.

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[illegible] FROM THE

[illegible]EMAN'S F[illegible]N.

[illegible] helped us assess the Oakland fire damage in under 48 hours, and earn the #1 customer approval rating. We do everything in Notes, from claims processing to tracking service levels. We've reduced our IS budget by $45 million, while delivering better service and more function. We considered using a messaging system, but Notes does so much more.

Virgil Pittman

[illegible]

Buried alive!

CONTINUED FROM PAGE 89

fines the terms cocky and confident. While I'm reviewing his resume, he decides it's an appropriate time to stand and gaze out my window for a 12th-floor view up Park Avenue. When he returns to his seat, he slings his arm over the back of the chair as if we're best friends out for a beer. Technically he's excellent, but I can't stand him, and there's no way I'd hire him. Just for fun, I ask one of the more technical people in my department to interview him to see if he can take this guy down a peg or two. Later, even the receptionist says there is something wrong with this one. **Another bust of a week: six down, three to go.**

I find the replacement for the still-missing Notes engineer. The recruiter sends me a five-page agreement. I tell him that I won't read it, much less sign it, unless it's kept to one page. Within hours, he's done it. I receive a good-looking resume for one of the positions in Connecticut, but the candidate is asking for a rate that is $10 an hour more than I am willing to pay.

I tell the recruiter I have several interviews scheduled with candidates who are in my range and that I'm holding off on his until I've met with the others. The agent wants to know if I'll schedule an interview with his client if he drops the rate by $5. I say yes. **Seven down, two to go.**

The candidate I didn't want to interview because of the rate turns out to be very good. I'm glad the agent dropped the rate but concerned that I could've just as easily missed out. I bring this one on; I also find the last person for Connecticut. **Finally! Nine down, none to go.**

It's now 125 resumes, 60 interviews, 20 agencies and 10 weeks later. It took, on average, six interviews and one week to fill each position. The lessons I learned won't be forgotten (see box).

As I send this to *Computerworld*, I get an electronic-mail message that one of the contractors I hired is leaving. As Al Pacino said in *Godfather III*, "Just when I thought I was out, they pull me back in again!" ■

Jaffe is the client services manager at the headquarters of a *Fortune* 100 company in New York.

8 lessons in 10 weeks

1. Define the position clearly to the recruiting agencies: The more information you provide about the position and the environmeot, the better they can screen candidates.

2. Redefine the position to the candidates: Let them hear everything from you directly so there are no misunderstandings.

3. Have the candidate meet the family: The more people who interview a candidate, the truer a picture you get.

4. Fees are negotiable: Tell agents a rate you're comfortable with and a rate you'd go to for a truly top-notch candidate

5. Agreements are negotiable: Tell your agent what you want and don't want in the written agreement.

6. Don't ignore personality issues: Personalities can be more important than technical skills. A type A personality in a maintenance role is destined to fail.

7. Recruiters work for you: If a recruiter is difficult to deal with, tell him. If he doesn't improve, drop him

8. Avoid the temptation to hire quickly: It is always worth extra time and effort to find the best person for the job.

CONTINUED FROM PAGE 89

Two IS centers formed

The **Technology & Business Institute**, intended to bring IS and business executives closer, was established recently. Scheduled sessions include chief financial officer/chief information officer coordination, information technology valuation/plan alignment and decision-support techniques. "These days decision-making teams need the same kind of help higher execs get, but they don't have the budget," says Jerry Mirelli, executive director.

Membership costs $345 per year, with discounts available for multiple members from the same firm. For more information, call Carol Zendt: (800) 676-9470.

Georgia Power Co. and the Georgia Institute of Technology have formed the **Center for Manufacturing Information Technology** (CMIT).

The CMIT offers Internet and World Wide Web demonstrations and helps companies solve manufacturing problems by choosing the appropriate technology — computer-aided design and manufacturing, robotics, database technology, wireless networks and bar coding. For more information, call Gary Birdwell at Georgia Power's Technology Applications Center: (404) 526-3685.

CIO = Prairie chicken

Russell Means, American Indian activist and occasional movie actor (he was the voice of Pocahontas' father in the Disney movie), told *Modern Maturity* magazine that one of his Lakota tribe names is Cio. It's "a bird from . . . the plains that does a beautiful dance during mating season. The white man calls [the] Cio 'prairie chicken.'" As if "Career Is Over" isn't bad enough. . . .

The old college try

Students at the **University of California at Berkeley's** Haas School of Business thought a CD extolling the school's virtues would be a good idea. The trouble was, professionals wanted more than $100,000 to produce the CD. Solution? Eighteen enterprising students made it themselves for a rock-bottom $9,000 in production costs and 68 cents a pop for pressing.

The two-hour disc includes student and faculty interviews as well as information on the Haas School and the San Francisco Bay area. You can see a sample at **http://haas.berkeley.edu/**.

Executive Track

David B. Schweibold has joined **E-Systems, Inc.'s** ECI Division in St. Petersburg, Fla., as director of IS. Schweibold was previously director of IS at Reflectone, Inc. in Tampa, Fla., a designer and manufacturer of aircraft simulators.

E-Systems, a Raytheon Co. subsidiary, develops and produces electronics systems and products; the ECI Division specializes in communications products.

John LoRe has been appointed CIO and vice president of IS at **Fila USA**. He is the first CIO at the maker of athletic footware and clothing.

Practical Internet Sites for IS Managers

By Leslie Goff

Using the four Internet sites listed below, you can land yourself a few job interviews, get travel information to plan your trips and sound extra smart by the time you face your prospective employer. If you are planning to stay right where you are, impress your higher-ups with the latest in U.S. and European information systems research.

Career Magazine

Sponsored by NCS Jobline, Inc., Boulder, Colo.

http://internet-plaza.net/careermag

This site is a comprehensive resource for finding or filling a job. From the home page, you can enter a Joh Openings database. For us, it generated seven hits for chief information officer positions, 200 hits for IS management positions and 109 hits for vice presidents of IS. The site features The Resume Bank, where you can post your resume or review others'; employer profiles; news related to IS careers; Career Forum, a moderated discussion group; and links to related career resources.

Association for Information Systems (AIS) 1995 Inaugural Americas Conference Home Page

Sponsored by AIS and the Hankamer School of Business, Baylor University, Waco, Texas

http://hsb.baylor.edu/ramsower/acis/index.html

This well-organized site actually is an IS on-line conference; all session tracks are available as electronic handouts. It is chock full of free papers and research, which can't be said of many Internet home pages. Most only give you abstracts, not full text.

This site contains 200 papers and 50 other presentations by 450 authors and panelists. The managerial and technical papers and panel discussions on topics such as "Researching Software Risk Management" were presented in August at the AIS Inaugural Americas Conference. They are indexed so thoroughly that it's a snap to find relevant reading. The AIS is an academic association whose members are researchers and educators. The papers presented here are well-written, clear and have practical applications for IS managers. Examples include: "An Enterprise Framework for Client/Server Technology Assessment and Implementation" and "Data Privacy and Computer Information Systems."

ISWorldNet

Sponsored by eight professional associations, including the Society for Information Management, the Association for Computing Machinery, the Association for Information Systems and the International Conference on Information Systems

http://www.isworld.org/isworld.html

This site seems very promising with its lofty mission to provide the IS community — its academics and professionals — with a single entry point to IS resources and promote the development of an international information infrastructure. The content still leans mostly toward the academic, but given the heavyweights among the founding organizations, it is worth bookmarking this site and watching for updates.

Be forewarned, however, that this site contains a handful of unreliable links. And because of its highly graphical format, it can be very slow. A plain text version of the navigation map is available from the home page. It isn't quite as easy to wade through the listings, but the performance is much better.

Go Explore

Sponsored by Go Explore LLC, San Diego

http://www.go-explore.com

Making last minute travel plans for your next IS conference? Need travel information quickly and in an easily accessible and readable format? Surf to this new site. At the click of a few on-screen buttons, Go Explore will give you the weather forecast and information pertinent to business travelers on topics such as hotels, restaurants, business services and local transportation in 50 U.S. metropolitan areas. It can even help you find a local FedEx Corp. or Western Union office and where to go to receive a fax or make photocopies. The site was created by frequent business travelers for their peers. It can help you customize your own itinerary to print and take with you. ■

Goff is a freelance writer in New York.

CORRECTION

There were two errors in the last edition of "Hit on This" [CW, Nov. 6]. A tilde was left out of the uniform resource locator (URL) for "A Business Researcher's Interests Home Page." The URL is **http://www.pitt.edu/~malhotra/interest.html.** There was a misspelling in the address for the David D. Lattanze Center Home Page. The URL is **http://ignatius.lattanze.loyola.edu/lattanze/index.html.** We apologize for the errors.

IT'S TIME FOR NOTES.

Waiting for

ft Exchange?

Make sure you know

what you're waiting for.

Choosing the right groupware is critical. Problem is, Exchange isn't groupware. It's messaging. And that's all it is. Microsoft wants you to believe that a messaging system is all you need. The truth is, only Lotus Notes includes world-class client server messaging integrated with a groupware

[illegible]

[illegible]

Th[illegible]

peop[illegible]

c[illegible]mmunicate, [illegible]

orate in teams and, most

importantly, build and

deploy custom applications

that coordinate mission-

critical business processes

like streamlining

product development

cycles and improving

customer service.

Lotus Notes is here now.

If you'd prefer something

less, wait a while.

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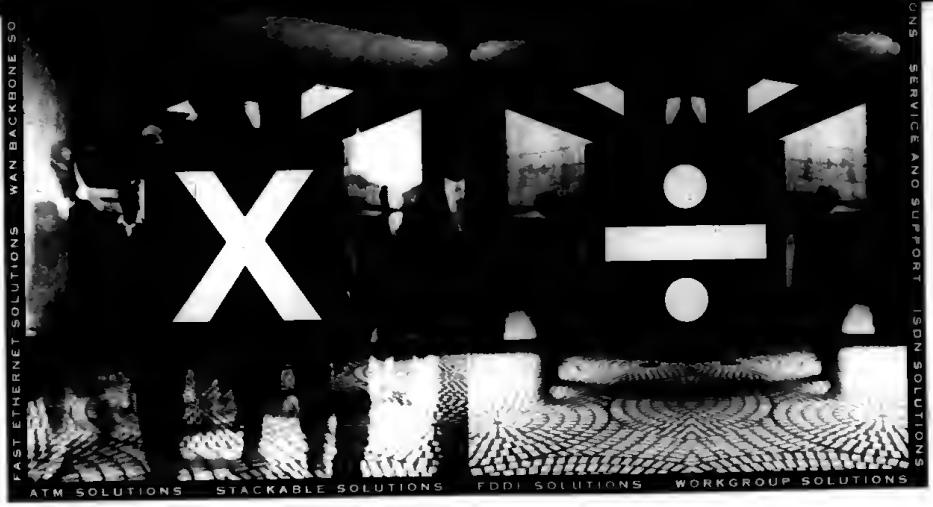
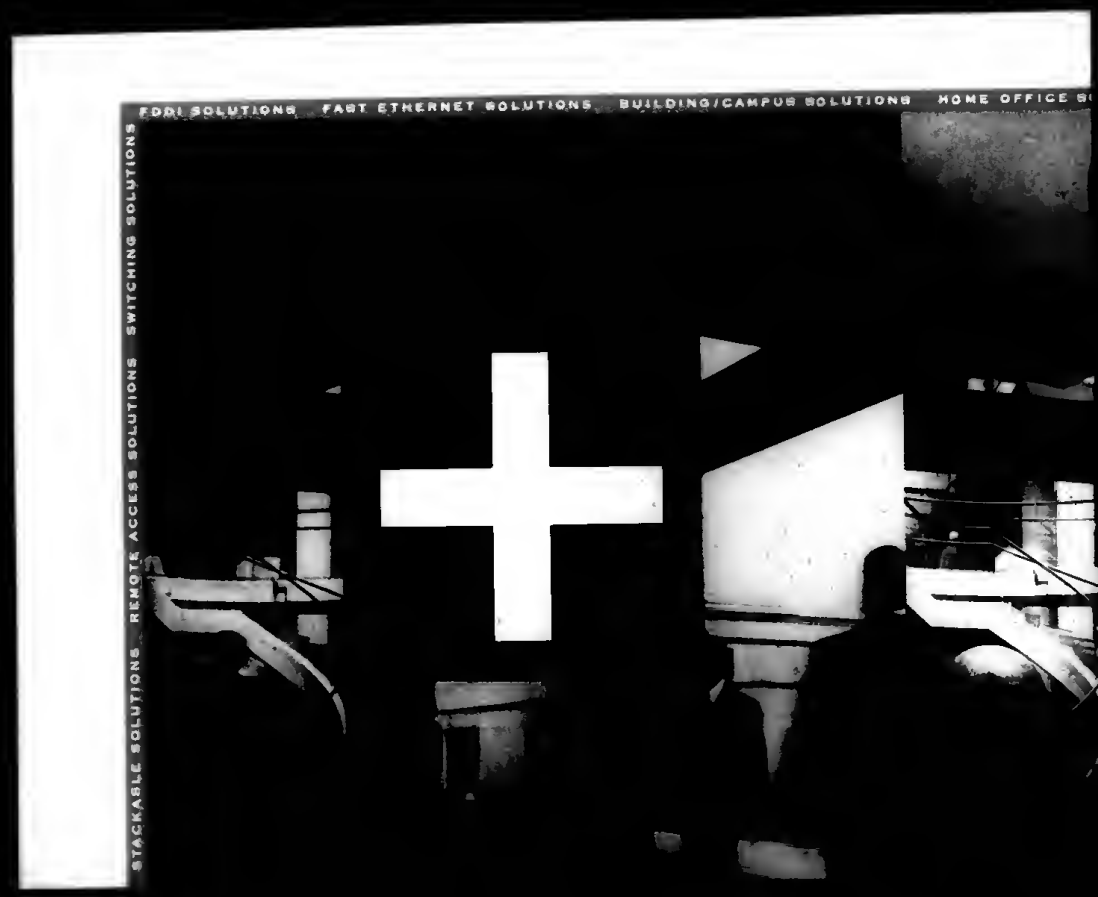
The Newspaper of IS

How well does your network let you perform these functions?





Does it let you add and
and networking functions
you need

*Customer must submit registration card for lifetime warranty to apply. Advance hardware exchange available during first year; thereafter return hub to 3Com. Power supply and fan warranted for one year only. Lifetime

ONS ETHERNET SOLUTIONS ISDN SOLUTIONS SMALL BUSINESS SOLUTIONS ATM SOLUTIONS

WORKGROUP SOLUTIONS

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subtract users when and where to?

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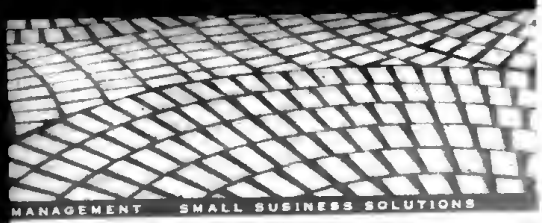
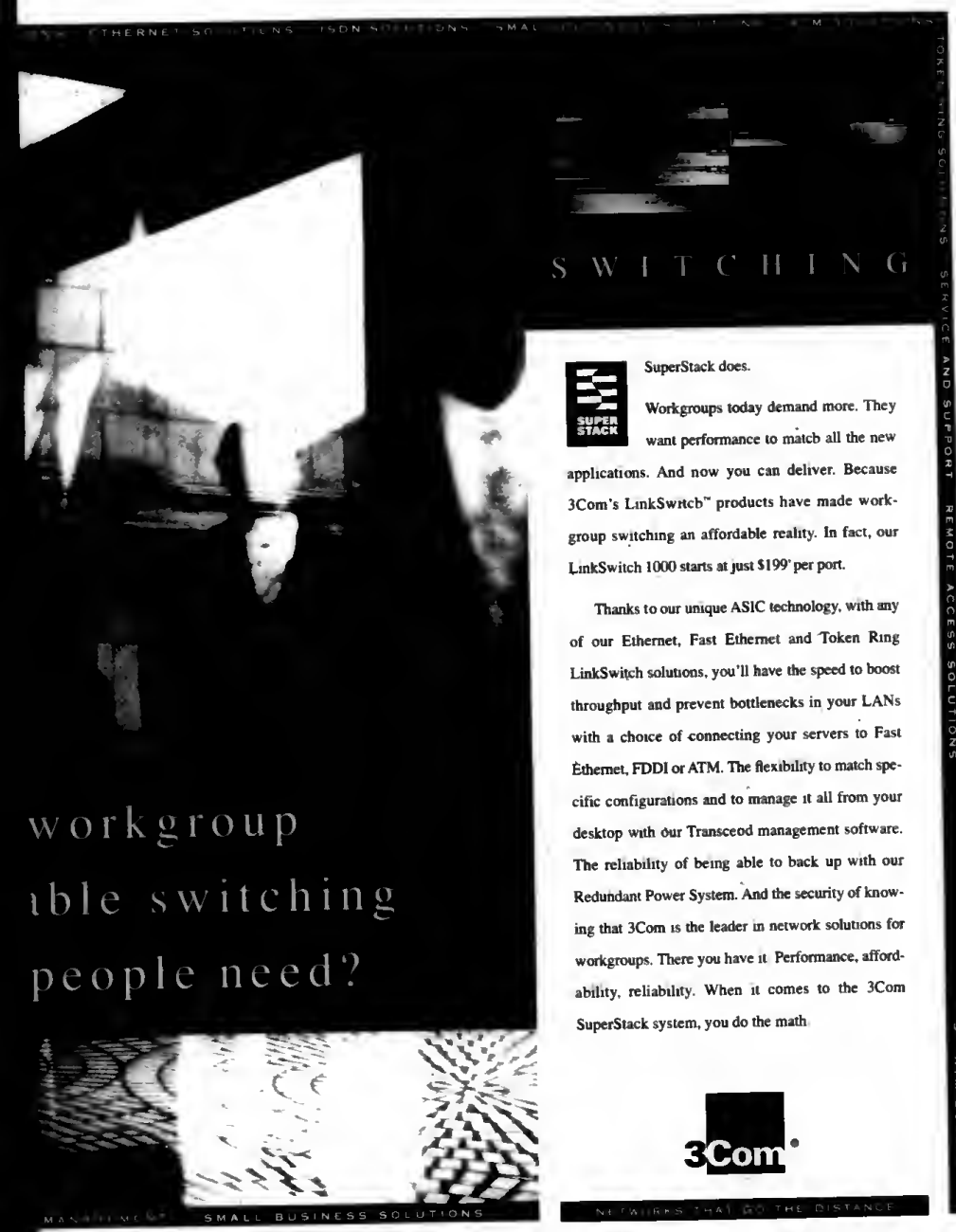


MANAGEMENT SMALL BUSINESS SOLUTIONS

*warranty not offered where prohibited or restricted by local law

Does it let you easily multiply
performance by giving you afford
to run the applications

Dollars are in U.S. currency



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ISDN SOLUTIONS

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LinkBuilder FMS II Telco
- LinkBuilder FMS II Management Module
- LinkBuilder FMS II Bridge Management Module
- LinkBuilder Bridge MicroModule

Fast Ethernet
LinkBuilder FMS 100
- LinkBuilder FMS 100 Base TX Transceiver Interface Module
- LinkBuilder FMS 100 Base FX Transceiver Interface Module

Token Ring
LinkBuilder FMS TR (12- or 24-port)
- LinkBuilder FMS TR RMON Management Agent Module
- LinkBuilder FMS TR Advanced RMON Management Agent Module
- LinkBuilder FMS TR Fiber RI/RO Module
- LinkBuilder FMS TR Copper RI/RO Module
- LinkBuilder FMS TR Copper/Fiber RI/RO Module

SWITCHES
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LinkSwitch 1000 10-100 (Ethernet to Fast Ethernet)
LinkSwitch 1200 (Ethernet to FDDI)
- LinkSwitch MSH Module
LinkSwitch 2200 (Ethernet to FDDI)
LinkSwitch 2700 (Ethernet to ATM)
LinkSwitch 3000 (Fast Ethernet)

Token Ring
LinkSwitch 1000 TR (TR only)
- LinkSwitch 1000 TR FDDI Module
- LinkSwitch 1000 TR TM Module

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AccessBuilder 2208 (8 port)

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NETBuilder Remote Office 222 (IP, IPX)
NETBuilder Remote Office 223 (SNA) (BR)
NETBuilder Remote Office 224 (IP)
NETBuilder Remote Office 227 (all protocols)
NETBuilder Remote Office 228 (connection services)

ISDN
NETBuilder Remote Office 421 (BR)
NETBuilder Remote Office 422 (IP, IPX)
NETBuilder Remote Office 423 (SNA) (BR)
NETBuilder Remote Office 427 (all protocols and WAN services)
NETBuilder II WAN Extender 2T1
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LinkConverter 251

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CW Guide to Electronic Mail

GARRY NICHOLS

WELCOME to the ENTERPRISE

Client/server E-mail promises to be cheaper, faster and more scalable. But should you buy it today?

By Lynda Radosevich

Corporate buyers of electronic-mail packages must figure out whether to buy now or later.

The leading E-mail products — Lotus Development Corp.'s CC:Mail, Microsoft Corp.'s Mail and Novell, Inc.'s GroupWise — are file-sharing systems based mainly on early LAN technology. These vendors appear to be homing in on early 1996 delivery of their delayed next-generation, client/server E-mail systems: Notes 4.0, Microsoft Exchange Server and GroupWise XTD. However, secondary vendors claim to be delivering client/server E-mail today.

In these next-generation versions, E-mail evolves from a single-purpose, self-contained system into a server-based transport facility for E-mail, groupware, workflow and other clients.

"If you're buying today for a single LAN, any of the current file-sharing E-mail packages are fine. But if you're buying for an enterprise, it's a different matter altogether because of the coming changes," says Daniel Blum, principal at Rapport Communication in Silver Spring, Md., and co-author of *Decisions '96: Lotus, Microsoft or Novell?*

The crux of the matter is that today's file-sharing E-mail systems don't scale well for large networks. "They were designed for LAN-based environments and small workgroups," says Bob Anderson, director of electronic messaging marketing at Control Data Systems, Inc. in Arden Hills, Minn. "The fact that file-sharing systems support limited numbers of users per post office makes it difficult to scale. One of our customers has 60,000 users, and to do that, it had to have 400 post offices. It was just a nightmare to try to maintain."

In contrast, client/server E-mail offers three main benefits over file-sharing systems. Blum says these benefits promise to reduce the cost of having an E-mail system.

BENEFIT #1

Firms can concentrate more users on a single message store, or post office, and it can have roughly 1,000 users per server, compared with 100 or so on a file-sharing server. That means there's less hardware to manage, fewer network connections and fewer potential points of failure.

BENEFIT #2

Larger client/server post offices reduce network

Electronic mail, *page 98*

CONSIDER THIS

- Do your users already have an E-mail system? If so, you must migrate them to the new platform or get the new and old systems to work together.
- Will the system run at the departmental or enterprise level? If it runs at the departmental level, will it have to link into the corporate system? What gateways will be needed?
- What kind of reliability do you need? Must the E-mail system operate 24 hours a day, seven days a week?
- Will you want network/service monitoring in place to generate alerts when problems occur? If so, does the package support the Simple Network Management Protocol?
- Do you have the staff to configure gateways, administer E-mail, create user accounts, do backups and act as postmaster for problem mail?
- Do you have the staff for documentation and training or will you buy this service from a vendor or third-party provider?
- Do users need remote E-mail service? Remote dial-in options? Can users download mail? If so, is it synchronized when they reconnect?
- What are your hardware requirements? Current packages support roughly 100 users per mailbox server, and most E-mail systems and readers require separate machines.

Source: Various sources on the Internet

INSIDE

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Top E-mail products 99

Buyers' Scorecard 102

Electronic mail

CONTINUED FROM PAGE 97

bandwidth requirements for the same amount of mail for two reasons: Client/server protocols generally have less overhead than the file-sharing protocol, and fewer messages need to cross the network because more users are on a single post office. So when users on the same post office exchange messages, the server switches database pointers rather than conducts network transfers.

BENEFIT #3

Client/server systems are more secure and reliable. In file-sharing E-mail systems, the desktop software actually accesses the file system on the server. That can cause the client to block a drive or a file on a wide-area network from performing an operation. If something happens to the network and the file locks, the server waits for the client to finish what it's doing, and everybody else is hung up. With a client/server messaging network, the client issues requests to the server. The server does its own locking and handles its own file system, so it's much less exposed. That translates into fewer problems that require costly support time to resolve.

This scalability is key because corporations are looking to use E-mail systems' underlying plumbing, the messaging system, as a transport mechanism for network applications such as workflow, document management, groupware and electronic commerce. As a sign of this increasing role, the industry has adopted the term "messaging" to incorporate the broader class of applications that rely on the messaging system foundations.

For instance, "if you don't want to implement a groupware package like Notes, you can use the messaging infrastructure to emulate [groupware capabilities]," says Brian Foster, E-mail project manager at Amoco Corp. in Houston.

The $27 billion petroleum company uses Hewlett-Packard Co.'s OpenMail servers and Lotus' CC:Mail clients for PC users and IBM's Professional Office System for mainframe users. It plans to use messaging as an infrastructure for messaging-enabled applications like workflow, invoicing and expense account approvals, Foster says.

Users who need client/server scalability have two choices: They can wait for Lotus, Microsoft or Novell to deliver, or they can turn to currently available options such as HP's OpenMail, Digital Equipment Corp.'s Mailworks or Control Data Systems' MailHub. These client/server messaging systems support popular E-mail clients, including CC:Mail and Microsoft's Mail (see chart, page 99).

If users prefer to buy an entire client/server messaging system from one of the leading vendors, analysts say their choices will depend on their company's overall computing strategy. For instance, if the firm is committed to Unix servers, that rules out Microsoft's Exchange, which runs only on Windows NT. If a CEO believes in the business case for Notes, that company would go with Notes/CC:Mail.

If a company is standardizing on Microsoft across the desktop and Windows NT on the servers, it would be driven toward Exchange. And if a company is aggressive in rolling out Novell's NetWare 4.1 and NetWare Directory Services, it might look more closely at GroupWise.

The other deciding factor is the current installed base of a vendor (see box, page 97). If the company has a lot of Microsoft Mail users, it might have a hard time switching to Notes because people like what they are used to.

Another main purchasing consideration is whether a firm is committed to open standards. The growing role of the Internet for both internal and external communications leads some firms to E-mail systems such as Siren Mail from Siren Software Corp. in Palo Alto, Calif., and Z-mail from Network Computing Devices, Inc.'s Z-Code division in Novato, Calif. These systems are based on Internet standards such as Internet Mail Access Protocol, Multipurpose Internet Mail Extensions, Post Office Protocol and Simple Mail Transfer Protocol (SMTP).

Internet hotshot Netscape Communications Corp. also is building E-mail capabilities into its Navigator software for the World Wide Web. Eventually, Web servers such as Netscape's will provide competition for proprietary systems such as Notes and Exchange, predicts Eric Hahn, a vice president at Netscape in Mountain View, Calif.

Users committed to the X.400 E-mail standard may want to consider E-mail systems from X.400 vendors such as Isocor in Santa Monica, Calif., and Enterprise Solutions Ltd. in Westlake Village, Calif. Although Internet-based SMTP messaging is growing by leaps and bounds, some firms with a large international presence must comply fully with the X.400 standard, especially if they operate in Europe. ■

Radosevich is a freelance writer in Belmont, Mass.

GLOSSARY

Electronic mail: The transmission of memos, messages and attached files over a network. Users can send mail to a single recipient or broadcast it to multiple users.

Messaging system: An essential system that provides the store-and-forward capability and the mail program that gives users an interface with the system's send and receive functions.

Client/server messaging system: A system that functionally divides the creation and delivery of an electronic message between an end-user program (the client) and a resource (the server) that responds to activity requests. Typically, the client provides content creation and addressing capabilities and can issue requests to the server. The server typically handles transport and storage functions and responds to requests from the client. Clients can be E-mail, electronic data interchange or other programs.

File-sharing E-mail system: A LAN-based E-mail system in which the message access and transfer intelligence resides in the PC software. The PC software stores messages in a file located on the network, the post office. But unlike client/server E-mail, the post office doesn't control access and transfers.

Internet standards: IMAP (Internet Mail Access Protocol), MIME (Multipurpose Internet Mail Extensions); POP3 (Post Office Protocol) and SMTP (Simple Mail Transfer Protocol).

MAPI (Mail Application Programming Interface): An interface that enables an application to send and receive mail over any MAPI-compliant messaging system. Lotus', Microsoft's and Novell's client/server systems all comply with MAPI.

Sources. Definitions drawn from *Newton's Telecom Dictionary* by Harry Newton, 1995; *The Computer Glossary* by Alan Freedman, The Computer Language Co., 1995; *The Electronic Computer Glossary* by Alan Freedman, The Computer Language Co., 1995; and the Electronic Messaging Association.

F.Y.I.

ORGANIZATIONS

Electronic Messaging Association
Arlington, Va.
Phone: (703) 524-5550
Fax: (703) 524-5558
E-mail: info@ema.org
Internet: http://www.ema.org/ema/
— EMA is a membership organization founded in 1983. Its members include more than 250 vendor and user companies involved in electronic messaging and information exchange. EMA publishes a quarterly magazine called Messaging Magazine.

European Electronic Messaging Association
Internet: eemaoffice@attmail.com
— A nonprofit international association formed in March 1987. Its objective is to promote, coordinate and assist in the development of messaging and support technologies in Europe.

ON-LINE INFORMATION

Internet newsgroups called comp.groupware and comp.mail.misc provide general information and discussions about groupware, messaging and internetwork mail.

For a listing of computer vendors on the Internet, check out the *Guide to Computer Vendors* by SBA Consulting at http://www.ronin.com/SBA/sba.html.

On CompuServe, messaging discussion threads can be found in the software forums for major vendors and the PC vendor forums for small vendors. Major vendors also host support forums. They include the Lotus Communications Forum (GO LOTUSC), Microsoft Workgroups Applications Forum (GO MSWGA) and Novell Connectivity Forum (GO NCONNECT).

BOOKS ON E-MAIL

New Riders' Guide to E-Mail and Messaging by Larry Morris, New Riders Publishing, 1994.

LAN Times E-Mail Resource Guide by Rik Drummond and Nancy Cox, McGraw-Hill, Inc., 1994.

Electronic Mail Systems, A Network Manager's Guide by Burhan Pulab, McGraw-Hill, Inc., 1994.

Using E-Mail by Dave Gibbons, David Fox, Alan Westenbroek, Dick Cravens and Andrew B. Shafran, Que Corp., 1994.

NEWSLETTERS

"Electronic Messaging News"
Phillips Business Information, Inc.
Potomac, Md.
Phone: (301) 424-3338
E-mail: Rhudak@phillips.com

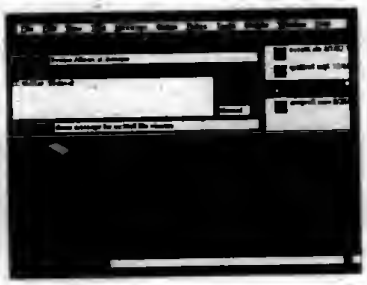
"Electronic Mail and Messaging"
BRP Publications, Inc.
Washington
Phone: (202) 842-3022
Internet: http://brpinc.com

The E-mail marketplace was worth $13.1 billion in 1994 and is expected to grow to $61.3 billion by 2000, according to EMA

LAN SYSTEMS

Lotus, Microsoft and Novell, in that order, are today's big three players in the LAN E-mail market. At press time, all three offered file-sharing systems, which typically support only 100 users or so per server. Often, LAN systems decisions are made at the department level.

The purchase prices listed are based on the necessary components for the following configuration: 100 end users running Windows desktops, one post office running on a Novell NetWare server, and gateway software for fax and Internet E-mail connections. Retail pricing varies.



Product: CC:Mail

Company: Lotus Development Corp., Cambridge, Mass.

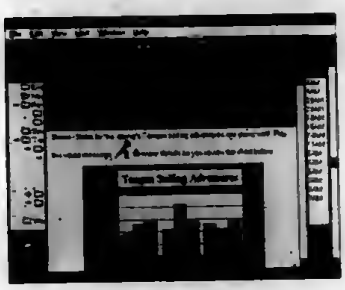
Contact information: Phone: (800) 448-2500; Web: http://www.lotus.com

Strength: Cross-platform support, good gateways, many related products from third-party vendors

Weakness: Lacks 24-hour-a-day, seven-day-a-week availability

Upcoming changes: Lotus plans in 1996 to release CC:Mail 7.0, which will fix the previous version's most glaring problem — the inability to take the system down for regular maintenance. Lotus also plans to release CC:Mail client software, which will use Notes 4.0 as the server.

Pricing: • LAN System, 100 licenses: $5,500 • Desktop for Windows 2.2 (includes desktop software, post office, utilities and administrator documentation): $95 • CC:Mail Router 5.13 (connects post offices on different LANs and mobile users): $95 • CC:Mail Fax gateway: $1,222 • CC:Mail SMTP gateway: $2,255 • Total for 100-user sample setup: $9,167



Product: Microsoft Mail

Company: Microsoft Corp., Redmond, Wash.

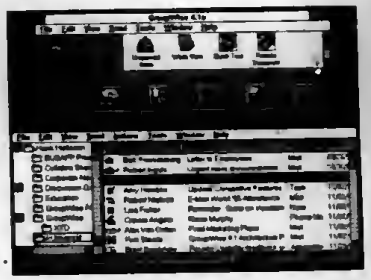
Contact information: Phone: (800) 426-9400; faxback service: (206) 635-2222; Web: http://www.microsoft.com

Strengths: Multitasking Message Transfer Agent on Windows NT platforms; full support for MAPI; free client in Windows 95 and Windows for Workgroups

Weaknesses: Weak SMTP and X.400 gateways, poor connectivity between Microsoft Mail for Apple Computer, Inc. networks and Microsoft Mail for PC networks

Client/server changes: Improved gateway support, management and scalability expected in the first quarter of 1996 under the name Exchange

Pricing: • Mail license: free with Office, Windows for Workgroups, Windows 95 or NT. Other platforms cost $4,495 for 100 user licenses. • Server (with router): $339 • Fax gateway: $1,329 • SMTP gateway (one gateway plus one access component): $3,300 • Total for 100-user sample setup: $4,968 (free client licenses) and $9,463 (no free client licenses)



Product: GroupWise 4.1

Company: Novell, Inc., Provo, Utah

Contact information: Phone: (800) 778-1851; E-mail: public@novell.com; Web: http://www.novell.com

Strengths: Available 24 hours a day, seven days a week; integrated mail; calendaring and task management at the client level; better scalability

Weaknesses: Limited support from third-party vendors; more expensive than CC:Mail and Microsoft Mail

Client/server changes: Integrated management with NetWare; integrated document management, forms and groupware; MAPI support, all expected in first-half 1996

Pricing: • GroupWise 4.1 Client/Administration Pack (includes five end-user licenses, administrative utilities and administrator's documentation): $695 • GroupWise 4.1 Volume License Pack for 95 users: $9,025 • GroupWise Message Server Pack NetWare Loadable Module: $2,495 • GroupWise Fax gateway: $2,495 • GroupWise SMTP gateway: $2,995 • Total for 100-user sample setup: $17,705

OTHER NOTABLE LAN SYSTEMS

Product: Notes
Company: Lotus Development Corp., Cambridge, Mass.
Contact information: Phone: (800) 448-2500; fax: (617) 693-3512
Distinguishing features: Groupware capabilities and rich application development environment

Product: FirstClass 3.0
Company: SoftArc, Inc., Markham, Ontario
Contact information: Phone: (800) 763-8272; fax: (905) 415-7151; E-mail: info@softarc.com
Distinguishing features: Strong in the Macintosh market; has a good bulletin board system

Product: BeyondMail
Company: Banyan Systems, Inc., Westboro, Mass.
Contact information: Phone: (800) 222-6926; faxback service: (800) 932-9226
Distinguishing features: Routing, filtering and strong integration with Vines and StreetTalk directory service

Sources: Rapport Communication, Silver Spring, Md., various vendors

ENTERPRISE SYSTEMS: *These E-mail systems are based on client/server architectures and perform and scale better than file-sharing systems.*

Product: OpenMail
Company: Hewlett-Packard Co., Palo Alto, Calif.
Contact information: Phone: (800) 637-7740; faxback service: (800) 231-9300
Distinguishing features: Scalable and manageable server; supports CC:Mail and Microsoft Mail

Product: TeamLinks or MailWorks
Company: Digital Equipment Corp., Maynard, Mass.
Contact information: Phone: (800) 344-4825; faxback service: (800) 723-4431, document number: 1075
Distinguishing features: Runs on VAX and Digital Unix

Product: Oracle Office
Company: Oracle Corp., Redwood Shores, Calif.
Contact information: Phone: (800) 672-2531; fax: (415) 506-7200; E-mail: office_info@us.oracle.com
Distinguishing features: Robust server; tight integration with Oracle database

INTERNET E-MAIL SYSTEMS: *These systems have a niche market at companies that are strongly committed to complying with the Internet access protocols.*

Product: Navigator
Company: Netscape Communications Corp., Mountain View, Calif.
Contact information: Phone: (800) 638-7483; fax: (415) 528-4120; E-mail: info@netscape.com
Distinguishing features: Integrates Web, E-mail and security functions into one server

Product: Siren Mail
Company: Siren Software Corp., Palo Alto, Calif.
Contact information: Phone: (800) 457-4736; fax: (415) 322-9999; E-mail: info@siren.com
Distinguishing features: Full compliance with SMTP, MIME, POP3 and IMAP Internet access protocols

Product: Z-Mail
Company: Network Computing Devices, Inc.'s Z-Code division, Novato, Calif.
Contact information: Phone: (415) 898-8649; fax: (415) 898-8299; E-mail: info@z-code.com
Distinguishing features: Multiplatform client support

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NOS may dictate E-mail choice

CC:MAIL

OVERALL SATISFACTION 92%

Lotus Development Corp.
Cambridge, Mass.
(800) 426-7682

	GOOD	VERY GOOD	TOTAL
User interface	54%	38%	92%
Reliability	43%	50%	93%
Compliance with standards	46%	31%	77%
Compatibility with server operating system	31%	69%	100%
Compatibility with network operating system	33%	58%	91%
Compatibility with client mail software	50%	50%	100%

GROUPWISE

OVERALL SATISFACTION 86%

Novell, Inc.
Provo, Utah
(800) 453-1267

	GOOD	VERY GOOD	TOTAL
User interface	40%	50%	90%
Compatibility with network operating system	50%	43%	93%
Reliability	46%	46%	92%
Scheduling capabilities	38%	62%	100%
Groupware/messaging capabilities	36%	64%	100%
Compliance with standards	45%	27%	72%

EXCHANGE

OVERALL SATISFACTION 80%

Microsoft Corp.
Redmond, Wash.
(800) 677-7377

	GOOD	VERY GOOD	TOTAL
Compatibility in suite applications	31%	31%	62%
Compatibility with network operating system	25%	50%	75%
Purchase price	45%	27%	72%
Compatibility with non-mail applications	50%	0%	50%
User interface	50%	44%	100%
Compliance with standards	63%	37%	100%

Base: 50 users per product. Overall satisfaction based on percentage of users offering "good" or "very good" ratings. Other figures are based on the number of users who cited the category as "important" to their purchasing decision.

By Kevin Burden

Each electronic-mail system reviewed here offers a unique quality that draws users into its fold. Novell, Inc.'s GroupWise has built-in groupware and scheduling features; Lotus Development Corp.'s CC:Mail works for firms that haven't decided if they should go Windows, Macintosh or Unix; and Microsoft Corp.'s Exchange has that Microsoft compatibility.

But after users evaluate the pros and cons of each system, it's often the network operating system that sways the final decision. Network operating system compatibility is the one functional area that's important to most users. "And while vendors claim a sense of openness, their E-mail systems are optimized for their own environments," says Gary Rowe, principal of Rapport Communication in Atlanta. "So if you are dependent on NetWare, GroupWise is going to look pretty good. And if you're into NT, it will be difficult to resist Exchange as your next generation."

Fifty users of each competing E-mail system were surveyed for this report. Users ranked the importance of factors leading them to their decision, then rated their satisfaction with the system's performance in each of those areas.

CC:Mail

One of CC:Mail's most enticing features is that it isn't married to an operating environment. "It's one of the main reasons people buy CC:Mail," Rowe says. He adds that users often are drawn to CC:Mail because they have mixed environments. "Lotus' strategy is to be compatible on as many platforms as possible, since it doesn't have the same ownership Microsoft and Novell have at the NOS level," he says.

CC:Mail clients run on Windows, OS/2, DOS, Macintosh and Unix — all with considerable success, judging by the 100% satisfaction ratings for compatibility with both client mail software and server operating systems. Success on these platforms also helped make CC:Mail users the most satisfied group in this survey.

On the migration front, Lotus will continue to enhance the file-sharing system CC:Mail is based on rather than move to a client/server system. Microsoft is moving to client/server with Exchange, and Novell plans to with the next release of GroupWise. "Lotus is extending and enhancing the current architecture, where Exchange is a major jump for current MS Mail users," Rowe says. It's unclear how Microsoft and Novell will support and enhance their current file-sharing E-mail environments.

GroupWise

GroupWise users want more than just E-mail — they want messaging, group scheduling, task management, serial routing and more. But GroupWise users want it all in a one-vendor, tightly integrated package — something Novell was first to offer.

"We didn't want to assign separate scheduling or calendaring packages," says Dan Lafrombois, a computer assistant at the U.S. Bureau of Indian Affairs in Billings, Mont. "We wanted a package serving multiple needs so there's only one vendor to blame if something goes wrong." So far, Lafrombois hasn't had any problems with the groupware and scheduling capabilities, and the 100% satisfaction ratings these capabilities received illustrates that problems aren't common. The groupware capabilities in GroupWise aren't nearly as powerful or programmable as those in Notes, says David Ferris, president of Ferris Research in San Francisco. But users say they are much easier to use and very adequate.

Just as important is that GroupWise comes from Novell, users say. Integration between GroupWise and NetWare 4.x is so tight that administrators can manage both from a single point of administration.

GroupWise snaps a NetWare Loadable Module into NetWare Directory Services, adding a GroupWise button to the NetWare 4.x management tool. "So when you create a new user on the network, you can create a GroupWise mailbox from the same tool," Lafrombois says.

Exchange

Exchange, Microsoft's next-generation client/server messaging system, is at a severe disadvantage in this review because its companion, Exchange Server, won't be available until the first quarter of 1996. Current Exchange users use only the in-box in Windows 95, which means they don't have the information-sharing and message management functionality Microsoft has been publicizing.

If the server portion were in use, there would be more reasons for choosing Exchange, Rowe says. Compatibility with the network operating system was a problem, for example. Many users surveyed use the in-box with NetWare, which works fine if you can figure out how to set it up, says Al Rahrs, technical service manager at the Nebraska Public Power District in Columbus.

NetWare compatibility should be less of an issue after the Windows NT-based Exchange Server is installed. "NT and NetWare can coexist," Rowe says. "But it means users will be supporting two operating environments," which many firms try to avoid.

Compatibility with non-mail applications also might have scored better. Microsoft touts Exchange as a universal in-box for E-mail, faxes and information from on-line services. But the only on-line service it can tap into is The Microsoft Network.

However, on-line service connections is an area waiting to bloom, thanks to Exchange's compliance with the Messaging Application Programming Interface standard, for which several on-line service providers have already written interfaces.

Users' top reason for choosing Exchange was compatibility with other Microsoft applications. But users saw room for improvement. Integration between Exchange and applications in the Office suite is there because it has to be. Exchange relies on the applications for functionality it doesn't include, says J. Cary Rogers, user support manager at Solvay Pharmaceuticals, Inc. in Marietta, Ga. ■

Burden is *Computerworld*'s senior researcher, Firing Line/Scorecard.

What we did ...

The goal of this survey was to find out what factors led companies to their chosen E-mail systems and how their E-mail systems perform in those areas. To do this, *Computerworld* contracted First Market Research in Austin, Texas, to contact 50 users of each E-mail system. The percentages in the charts represent users who rated their product either "Good" or "Very Good." The majority of the users gave "Fair" scores.

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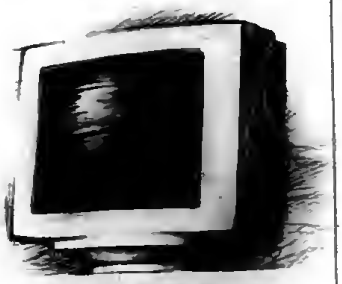

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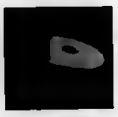
Source: Survey of COMPUTERWORLD CD subscribers, May 1993.



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In Depth

Ticket to Nowhere?

Mail-order schools lure fledgling code jockeys with promises of big bucks and excitement. But a new survey finds hirings are rare.

By Joseph Maglitta

Though his father and uncles were auto mechanics, Phillip H. Johnson figured that clean software code, not clean carburetors, would be his ticket to the American dream. Today, he says, wrenches don't look so bad.

In July 1994, the 24-year-old laborer sent away for a $2,815 programming course he'd seen advertised in *Omni* magazine. After zipping through the first 30 lessons, Johnson was eager to begin hands-on programming.

But Johnson says his enthusiasm vanished after NRI/McGraw-Hill Continuing Education Center took six months to deliver a promised IBM-compatible 486SX computer to his suburban St. Louis home. "It was hard to get going again," he says. Now Johnson says going into the PC repair business with another uncle seems like a better bet.

Unfortunately, his chances of finding an entry-level programming job won't be much better if he gets a certificate. Thousands of would-be coders such as Johnson are spending millions of dollars a year only to discover that mail-order courses are rarely the ticket to the glamorous jobs and riches they're promoted to be.

Phillip Johnson never fulfilled his dream of becoming a programmer

While 58% of 200 U.S. companies surveyed by *Computerworld* say they'd consider hiring programmers who learned the craft from a correspondence school, only 2% have actually done so. Information systems chiefs say they shy away because mail-order students are believed to have poorly developed technical skills and an unfamiliarity with the business environment.

Many echo Paul J. Blazek, director of software development at Life Care Centers of America in Cleveland, Tenn. He applauds the self-motivation needed to complete home study but says, "I don't necessarily give plus points for the experience."

"I feel bad for people who choose computer programming because they are looking for big bucks or lots of sex with programming groupies," says Robert A. Moeser, a contract programmer in Brighton, Mass.

Ticket to nowhere, *page 109*

Maglitta is *Computerworld*'s senior editor, features.

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Ticket to Nowhere?

CONTINUED FROM PAGE 105

Despite scandal, great popularity

Skepticism isn't unwarranted. From 1979 to 1992, the Federal Bureau of Investigation put 60 diploma mills and other mail-order schools out of business for fraud and mismanagement. In the early 1990s, correspondence schools lost federal education funding, except from the G.I. Bill and a similar Navy program. And some schools' troubles persist (see story below).

Yet enrollments are booming. Some 3 million people in the U.S. took mail-order courses this year, according to the Distance Education and Training Council (DETC), an independent accrediting agency in Washington. Industry estimates say $1 billion to $2 billion a year is spent on correspondence courses.

"Computer courses are our fastest-growing offering," says Gary Keisling, CEO of ICS Learning Systems. The Scranton, Pa.-based organization is one of the two biggest mail-order schools. Keisling says brisk sales of computer-related subjects have helped ICS double its consumer sales in the past three years. "This year, 50,000 people have enrolled in five basic programming and use courses," he says.

Advertisements for mail-order programming courses and degrees scream from the back pages of *Popular Science*, *The Weekly World News*, *USA Today*, *The New Yorker* and other publications. "Learn computer programming at home in your spare time. It's easy! It's fun! ... And it's so convenient!" reads one promotion. Several more read: "Experienced programmers can make $50,000 a year or more!"

These pitches omit two key points: Since the days when companies advertised on matchbooks, correspondence schools have never been seen as serious suppliers of software programmers to industry. And programmer/analysts have an annual average salary of about $37,000, according to *Computerworld*'s 1995 salary survey [CW, Sept. 4].

"Mail-order firms are interested in trying to figure out how to take money out of your pocket and put it in theirs without doing any work," says M. Victor Janulaitis, CEO of Positive Support Review, Inc. The Santa Monica, Calif., consultancy, among other things, tracks IS hiring. After more than 30 years in IS, Janulaitis, a former Bix Six consultant, says he's never met anyone with a mail-order programming degree.

> "You do tend to run a risk if you don't [hire someone] with a degree that you're getting a code cowboy."
>
> Skip Goodwillie, director of technical staff, Merge Computer Group

Factors dull appeal

According to interviews and industry research, several factors complicate hiring decisions:

Skills gap. Mail-order graduates' skills remain questionable. Observers caution that it's unlikely mail-order programmers know structured development methodology or structured testing procedures. "You do tend to run a risk if you don't hire someone with a degree that you're getting a code cowboy," says Skip Goodwillie, director of technical staff at Merge Computer Group, a temporary placement firm in Knoxville, Tenn.

Knowing a programming language, Janulaitis says, isn't the same as being able to code. "When you go through canned programs, you know how to do the problems the instructor was teaching, not necessarily how to do processing," he says.

Only one course reviewed by *Computerworld* offered any of 20 skills IS managers say they want most, including SAP AG's SAP, Next Computer, Inc.'s NextStep, The Stepstone Corp.'s Objective-C and Smalltalk [CW, Nov. 13]. And the school offering that course, NRI, offered only one in-demand skill: C++. NRI has recently begun advertising Windows 95 training as part of its beginning programming courses.

Programming courses at ICS are typical. Its basic course covers Quick Basic; the master course covers C and Microsoft Corp.'s Visual Basic. ICS also offers a multimedia programming option.

Eli Cohen, a veteran of various Data Processing Management Association (DPMA) educational boards, reviewed course outlines from four mail-order schools for *Computerworld*. "I was struck that graduates are likely to program only on PCs and then only in a variation of Basic or C," he says.

Moreover, a reliance on printed books and note-

Ticket to nowhere, *page 113*

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Ticket to Nowhere?

CONTINUED FROM PAGE 109

books can make it difficult to update courses. "In a home-study curriculum, when you get Windows 95 or other big-time stuff because of printing costs, it's easier to say, 'I think we can wait another year before updating materials,'" says John B. Bear, a San Jose, Calif.-based authority on nontraditional education. For 13 years, Bear served as a consultant to the federal investigations of correspondence schools.

Correspondence schools also fall short in the area of "soft" skills. IS managers, recruiters and academicians note that it takes more than technical skills to succeed as a programmer. They say business understanding, people savvy and teamwork can be equally or more important.

"The ability to code is a hygiene factor," Cohen says. "You have to have it, but by itself, it's not enough." Cohen, a professor at Eastern New Mexico University, adds, "To learn programming from a business perspective requires a business perspective."

$$$$

Part of the reason programmer-hopefuls gravitate toward mail-order programming courses is that they're, well, cheap.

Or are they?

While programmer certificates cost an average of $3,000, a home-study bachelor's degree from Cooke's Institute of Electronic Engineering in Jackson, Miss., will run you nearly $12,000.

At nearby University of Southern Mississippi in Hattiesburg, you can receive a bachelor's degree from the accredited school for about $9,872.

• **Poor quality control.** Sixty percent of companies in the *Computerworld* survey say they require programmers with a four-year college degree, usually from an institution accredited by a federally recognized agency. While some correspondence schools offer associate's, bachelor's and even master's degrees in computer science, certificates are more common. Bear cautions that these schools shouldn't be confused with the 120 or so traditional colleges and universities such as the University of North Carolina that also offer correspondence courses.

The quality of graduates and programs varies greatly. Some mail-order programming schools are diploma mills that require little or no work. Some are neither accredited nor licensed by the states in which they operate. *Bear's Guide to Earning College Degrees Nontraditionally* lists 300 allegedly fraudulent mail-order operations.

None of the approximately two dozen mail-order schools offering programming courses or degrees are accredited by any of the six federally recognized regional agencies nor by the Stamford, Conn.-based Computing Science Accreditation Board.

Only eight mail-order programming schools hold the national, professional certification from the DETC: Grantham College of Engineering in Slidell, La.; Hemphill Schools in Pasadena, Calif.; McGraw-Hill in Washington; NRI Schools in Washington; Microcomputer Technology Center in Woodbridge, Va.; People's College of Independent Studies in Kissimee, Fla.; and two ICS units.

Unfortunately, Bear notes, the U.S. Department of Education stopped accrediting schools in the early 1960s. "So accreditation no longer guarantees quality," he says.

Some mail-order schools are essentially self-accredited. Take the American Institute of Computer Science (AICS), for example. The Birmingham, Ala., school is accredited by the World Association of Colleges and Universities (WACU). According to the Alabama Commission on Higher Education, WACU is run by the owner of four mail-order schools, one of which is AICS.

"Licensing is a consumer protection ... and accreditation is voluntary," says Elizabeth French, the commission's director of nonresident institutions. Without licensing and accreditation, French says, schools can "operate essentially without any oversight. They can do pretty much what they want."

• **Limited supply.** Despite the seemingly high numbers of mail-order students, relatively few finish coursework.

Unfortunately, only one of two dozen mail-order schools responded to *Computerworld*'s telephone and fax requests for information, including the number of programming studeots enrolled, graduation rate, placement assistance and other basic information.

ICS estimates about one-third of students finish their programming courses. A study last year by the DETC found the graduation rate st even the best mail-order schools was as low as 15% and sveraged 39%. The industry defends the figures by saying that adult students tend to have more pressures and obligations than conventional students.

• **Lack of entry-level opportunities.** The shortage of experienced talent has become serious for some hot specialties. But it is often s different story for beginning programmers.

"I was struck that [mail-order] graduates are likely to program only on PCs and then only in a variation of Basic or C."

Eli Cohen, DPMA educational board veteran

"I need to hire experienced people," says Blazek, whose company owns and manages nursing homes in 27 states. Blazek's minimum: three years in the field.

Several programming managers and recruiters also say mail-order graduates face heavy competition from low-priced offshore programmers in India, Asia and elsewhere.

• **Poor placement.** Only 21% of nationally accredited correspondence schools offer placement assistance, making it difficult for potential employers and students to find each other. Assistance is thought to be even less common at unaccredited schools.

ICS doesn't track how many students get jobs. But Keisling attributes slim hiring figures in *Computerworld*'s survey to low awareness among employers and relatively small numbers of graduating students. "It's really something that is just ramping up," he says.

Slim hope

So is there any hope for programmer wanna-bes that have neither the money nor the time to attend accredited colleges full or part time?

Maybe.

In the past 18 months, says Jon Marshall, an IS recruiter for Robert Half International, Inc. in Omaha, some firms have cut requirements for programmers from four-year degrees to two-year degrees to certificates. "Now that the market is tighter, people are starting to stretch reqoirements," he says.

Observers say opportunity, if it exists, may he in less-than-glamorous jobs. In a large-scale platform conversion where there are thousands and thousands of lines of code that need to be written "there are many needs where s pick and shovel, grunt-level coder is necessary," Goodwillie says.

Others say performance, not pedigree, matters most. "We have people with no degrees, people with computer school certificates, bachelor's, master's and one Ph.D.," says 15-year IS veteran Paul Flanagan, vice president of information services at Christian Broadcasting Network in Virginia Beach, Va. "We bring in people who know what they are doing. f don't care where they learned it."

Schools and supporters say home-study students are well-suited to today's downsized work environment. DETC, for example, cites an independent 1982 study of more than 12,000 mail-order students. The findings: Correspondence learners showed strong ability to work independently, learn on their own, persist at difficult tasks and organize time effectively.

The industry predicts continued growth, thanks in part to easier-to-learn object-oriented programming tools. Keisling and others say they have begun to merge mail-order with bulletin board and Internet-based training.

Yet until things change dramatically, would-be programmers such as Johnson will continue to find a bumpy road to code. ■

Fighting an Uphill Battle

58%

of companies say they would consider hiring programmers with a correspondence school background ...

... but only 2% of the companies have actually hired someone who learned software programming this way

In fact, 60% of companies say they require that programmers hold a four-year college degree

Source: Computerworld survey of 200 U.S. companies

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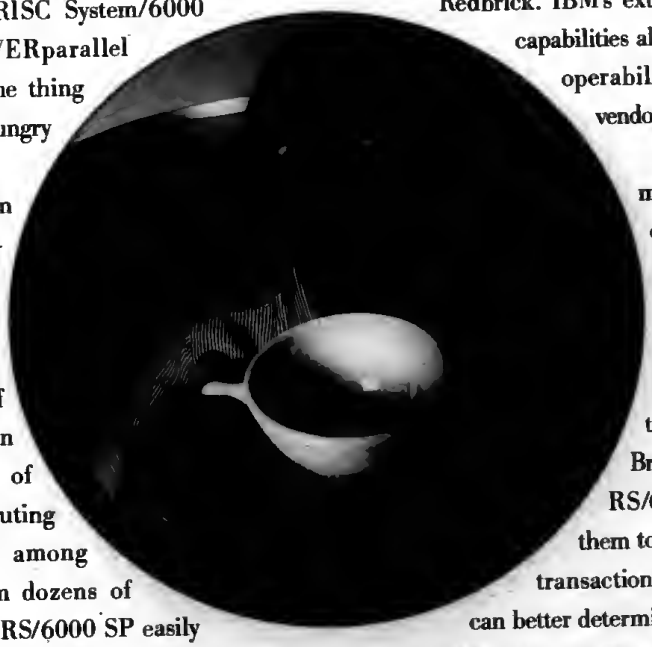

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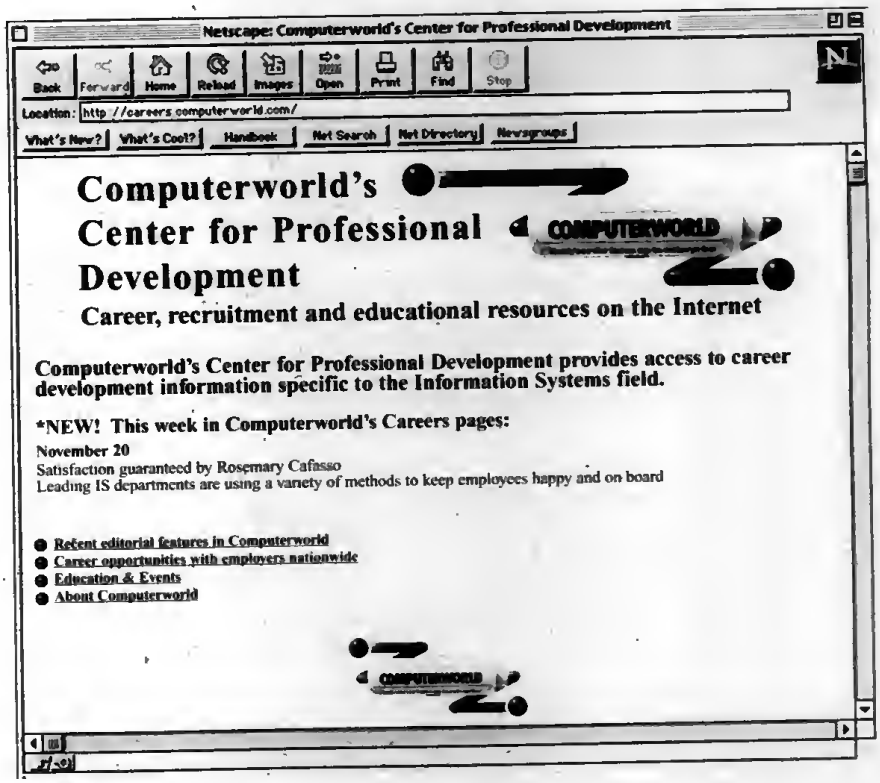

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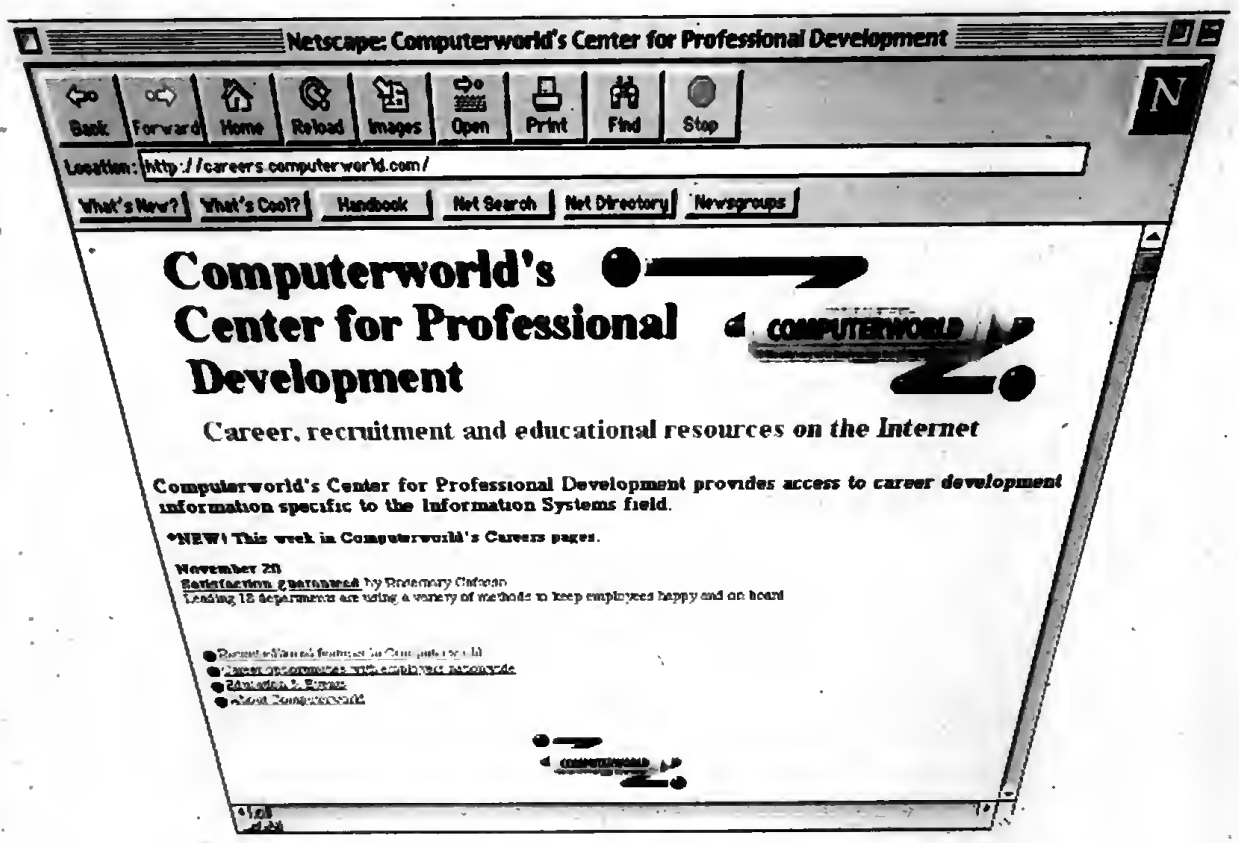

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Computer Careers

Balance of power

Many women who make it to the top in IS feel they have to work twice as hard as men to get there. Among the biggest challenges: juggling professional and personal success.

BY LINDA WILSON

Carol J. Anderson knows all about working hard and rising to the top. For the past 5½ years, she's been the vice president of information technology at TTX — a Chicago company at which she's worked for the past 23 years. That's quite a feat in information systems, where the top echelon is still dominated by men. *Computerworld* recently talked to four women at the top of IS about what led to their success. Despite their different jobs and backgrounds, they faced the same challenge of balancing personal and professional demands.

Making more room at the top

Women represent one of every three employees in IS departments but only one out of every 13 CIOs. What are leading organizations doing to help more women reach the top IS ranks?

40%	Offer affirmative action/anti-glass ceiling programs.
30%	Seek outside female candidates for IS vacancies.
22%	Train female IS employees in management techniques.
18%	Offer formal mentoring programs.
12%	Provide day care services for employees' children.

Source: Ameritech, 1994 survey of 50 human resources departments by the Society for Information Management and Open Computing magazine.

CAROL J. ANDERSON
Vice president of information technology since Jan. 1, 1990
Company: TTX, Chicago

Background: Director of systems development and planning, TTX, 1980-1989; manager of systems development, 1976-1980.

Carol Anderson is convinced that an all-work-and-no-play schedule is unhealthy. But making time for outside interests is no easy task. Neither is promoting on-the-job victories.

Her job as vice president of information technology at TTX is quite demanding. Right now, it includes overseeing a long, complex and stressful migration to a client/server architecture. "We have installed a couple of very strategic client/server systems, and we are working on a couple of others," she says.

Anderson says, "I had to do a little better job every step of the way." She advises: "Be sure that your contributions are visible. This is an area where women hold back a little."

Meanwhile, her professional commitments leave little time for play. Anderson is active in the Society for Information Management. She's a past president of the Chicago chapter and a director of the international association, which also is based in Chicago.

"It is very tough. You have to be very organized because you get very pressed for time," Anderson says.

MADELEINE WEISS
President since 1982
Company: Weiss Associates, Bethesda, Md.

Background: Faculty member at The Center for Technology and Administration, American University, Washington, 1977-1979; programmer/analyst, project manager, Electronic Data Systems Corp., 1967-75.

Madeleine Weiss has always felt pulled between career and family. That's why she launched her own consulting firm, Weiss Associates, in 1982.

"I have three children, and I didn't want to be in the position of constantly putting them last," says Weiss, who launched Weiss Associates when her now-grown children were young.

Weiss chose consulting because it had more flexibility than a full-time corporate job and let her retain the "hands-on" experiences she enjoys. She says it's important to "be very clear about what you want, what legacy you want to leave and what you want to focus your energy on."

Weiss specializes in organizational change — both in the IS department and throughout the corporation. As her own boss, Weiss has had a lot of discretion in her choice of assignments. "I've turned down assignments which would have meant commuting," Weiss says. "I have the option of saying, 'No, I don't want to go work in St. Louis for six months.'"

Wilson is a freelance writer in GlenEllyn, Ill.

MARY JO GREIL
Sector IS manager, Memphis Operations Center, since March
Company: International Paper Co., New York

Background: Manager of planning and controls, International Paper, 1991-1995; manager of systems, National Laboratories, Inc., Memphis, 1986-1989; AMCA International, Memphis manager of development for electronic administrative systems, 1980-1986.

Mary Jo Greil isn't a mom, but she still struggles daily to maintain a balanced life. "I still try to balance my work with social activities, community, church and my health," Greil says.

That's not an easy task. In March, Greil was promoted to IS manager for a $7 billion sector of International Paper Co. Before that, she was manager of planning and controls at International Paper for four years and, prior to that, director of IS at National Laboratories, Inc. in Memphis for three years.

Greil puts in long days, averaging more than 60 hours a week, including weekends. She also travels — a lot. Nearly 80% of her time is spent traveling. She's also active in the Society for Information Management and was a founding member of its Memphis chapter.

But non-work endeavors are important to Greil. She's a director of the YMCA in Memphis and is active in the International Institute for Non-Violence. Finding the time "takes organizational skills and special scheduling," Greil says. For example, agendas are distributed ahead of time so everyone is prepared. She follows that approach at the office as well.

FRANCES CRAIG
President since 1988
Company: Computer Strategies, Inc., Vienna, Va.

Background: Executive vice president of advanced technologies, Maxinus, McLean, Va., 1986-1988; director of development, Net Express, Vienna, Va., 1982-1986; director of information resources management, GTE Telenet, 1980-1982; director of academic computing, variety of other director positions, Carnegie Mellon University, 1971-1980.

In her struggle to balance career and family, Frances Craig found one solution: networking with other women.

After the birth of her second child in the late 1970s, Craig formed a women's group at Carnegie Mellon University in Pittsburgh. As director of user services, Craig saw the group as a way to address the stress she was feeling from both working and raising a family.

The group, called The Women's Task Force, met six times a year. The meetings gave Craig an opportunity to listen to speakers address topics related to balancing career and family as well as to chat informally with other women.

"I just felt other women also would like to know more about how to succeed in the workplace while also having a family," Craig says. She also belonged to another local women's group, The Executive Women's Council.

She's now a member of the Society for Information Management and the Fairfax, Va., Chamber of Commerce. These associations, she says, help her as a partner in a technology business. "It's important to get together with other people and share," Craig says. ■

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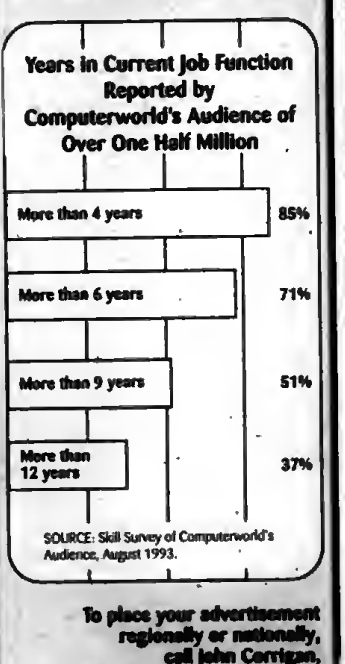

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Regional Scope

Making it in the Big Apple

Internet, multimedia are latest hotbeds for IS job seekers

BY ALAN R. EARLS

New York, New York is a helluva town. The Bronx is up and the battery's down. Not so with information systems hiring. But don't show up in sneakers, and make sure you're toting a model resume if you expect employers in the Big Apple to roll out the welcome mat.

Recruiters and IS managers agree that New York and nearby areas including Northern New Jersey are quickly becoming an employees' market. Many skill sets are increasingly hard for employers to find, and salaries are beginning to rise, sometimes dramatically.

But be forewarned: Metro New Yorkers generally expect their IS professionals to look and act the part. So be prepared to speak the language of business and technology.

"Companies in Northern New Jersey and in New York City want the best people. They don't care where they come from, they just want talent," says Roger Sichel at Robin Rogers Consulting, a solutions provider in the city.

"There is a hiring climate we haven't seen here for at least five years," says Vincent Rios at Source Services Corp., a national recruiting firm in New York. Rios is in charge of the tri-state area, which comprises New York, New Jersey and Connecticut.

Rios says his office handles almost double the volume of business compared with a year ago. "We are seeing great demand for people who can use development tools to quickly develop solutions," he says. Those tools include graphical user interface (GUI), Microsoft Corp.'s Visual Basic and client/server database technology, Rios says.

THE TOP EMPLOYERS

RANK	EMPLOYER	NUMBER OF EMPLOYEES
1.	The city of New York (government)	200,000
2.	Nynex (telephone company)	25,000
3.	Chemical Bank (bank)	20,000
4.	Citicorp (bank)	15,000
5.	Primerica (financial services)	12,000
6.	American Express (financial services)	10,000
7.	Consolidated Edison (utility)	10,000
8.	Merrill Lynch & Co. (financial services)	8,000
9.	Port Authority of N.Y. and N.J. (government)	7,000
10.	Capital Cities/ABC, Inc. (media)	5,000

Source: City of New York and New York Business Information Co.

Earnings potential

Salaries also indicate demand. Rios says programmer/analysts with from one to five years of client/server experience earned an average annual salary of $47,000 in the fourth quarter last year. Now, they can command salaries at around $55,000, he says. Average salaries for LAN administrators have been ramped up over the same period, from $49,500 to $52,000.

But even with increased salaries, demand still sometimes goes unmet.

"We have a very specialized focus. As a consequence, we sometimes have trouble finding the people we need," says Sidney Finehirsh, president at Compumetrics, Inc. in New York, a tool vendor that also offers consulting services. High on Finehirsh's wish list are IS professionals with GUI skills and an understanding of computer performance measurement.

Pepsico, Inc. in Westchester, N.Y., faces a similar situation. "A year and a half ago, we decided we would hire the specific skills we needed, strong people that could hit the ground running on Sybase, Inc. [databases], [Powersoft Corp.'s] PowerBuilder and [Hewlett-Packard Co.'s] Unix," says Jerry Gregoire, vice president of information technology.

But the results have been disappointing, he says. This is largely due to a shortage of people — programmers, for example — with those skills. He also notes that those with the skills "often are job-hoppers."

Gregoire says he is changing tactics. "We accept that there is plenty of similarity between Sybase and Oracle, so we will try to find the best person with a compatible skill and then train them," he explains.

Pepsico also will fill about 25% of its IS positions with college graduates. "They don't know much, but they are eager and enthusiastic," Gregoire says.

Rios says market demands have helped a few IS professionals win giant salaries in New York; at least one professional he knows earns a whopping $250,000 a year. "Although some of this comes from multimedia or other parts of the economy, I think most of it is the financial services companies," Rios says.

"The problem with the financial services firms is a lifestyle issue," says Alan Johnson, managing director at Johnson Associates, Inc., a compensation consulting firm. "They've done the downsizing, and now they are very interested in new technologies," he says. But Johnson says financial services firms aren't offering "9-to-5 jobs, they're offering 8-to-10 jobs."

Johnson says fewer people are willing to sign on for such an all-consuming work schedule. The result is that "there is starting to be some upward movement on compensation," he says.

Even without client/server credentials, New York's canyons of steel still beckon. Because fewer IS graduates are focusing on mainframe technology, those with mainframe skills are entering a potentially helpful supply-and-demand situation.

Next wave

But an IS executive at a large financial services firm, who requested anonymity, warns against thinking of the organizations that still use such skills as "traditional." He says his firm is among those leading the charge toward new technologies, especially the intranet — Internet technology harnessed for internal company communications.

"We have major offices in London, Singapore and Tokyo. We are putting all our analysis and reports on an internal [World Wide Web] server so everyone can access them because the economics are very compelling. It is very low cost," the executive says. Tools such as Sun Microsystems, Inc.'s Hot Java, which have made the Internet so successful, are being devised for intranet uses, he says.

But for growth potential and technical excitement, he says the Big Apple's multimedia industry is the real place to be. This other end of the IS spectrum is a cross-pollination of technical skills and the creative arts channeled into the mediums of CD-ROM and the Internet. According to the New York New Media Association, there already are at least 100 such companies in the city, and those companies employ about 10,000 people.

"The high-tech industry, particularly the multimedia sector, is without a doubt one of the hottest growth fields in New York City," says John S. Dyson, New York's deputy mayor for finance and economic development. "It has already become an important job producer for the city's economy and will likely continue to spawn even more jobs in the coming months and years." ■

Earls is a freelance writer in Franklin, Mass.

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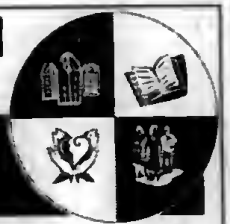

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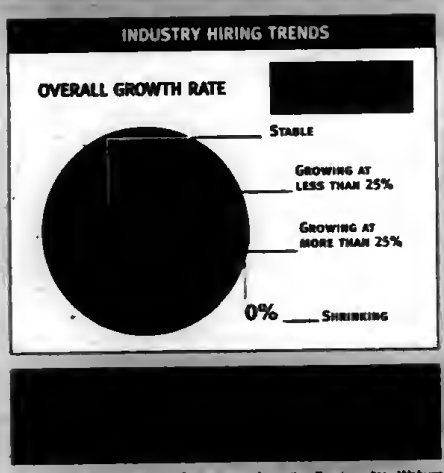

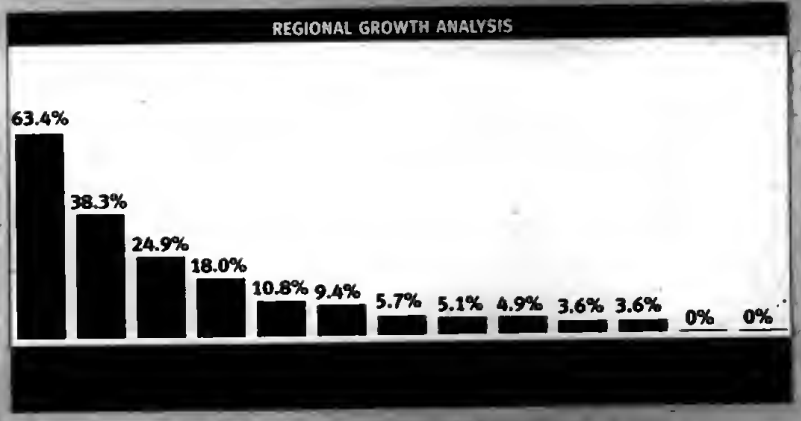

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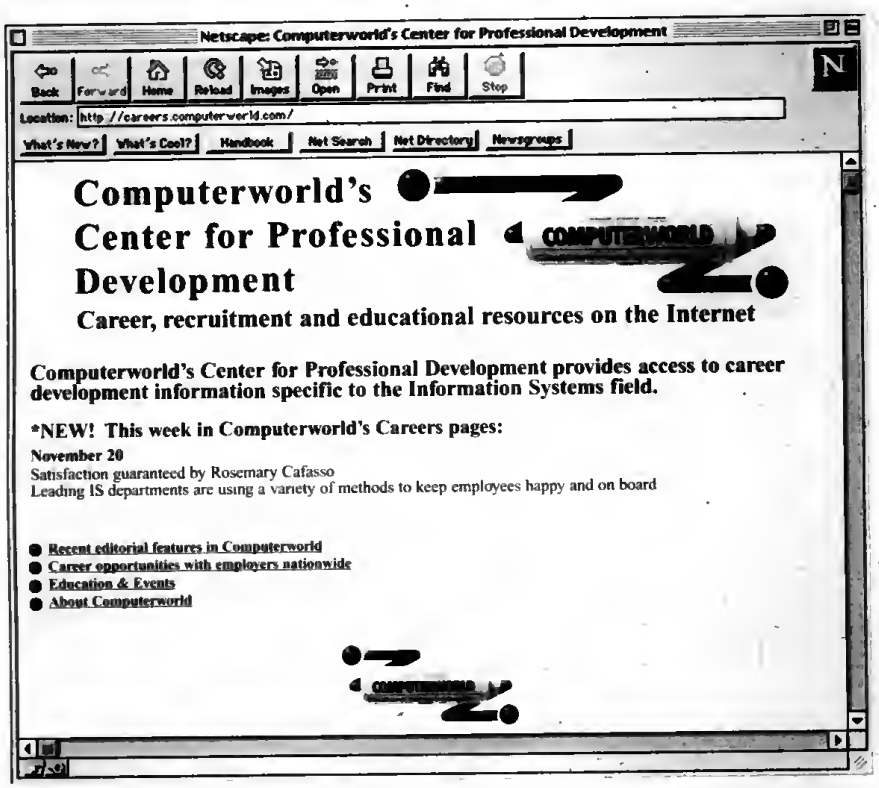

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Marketplace

Scheduled for a boom

Enterprisewide scheduling is taking off

By Daniel Lyons

Group scheduling programs, which let users make appointments and arrange meetings, entered the corporate world at the workgroup level. Now, group scheduling technology is moving into enterprisewide solutions.

"The market is changing simply because of the increased presence of [electronic mail] and because of natural business forces," says Linda Myers-Tierney. She is the director of electronic workplace technology at International Data Corp. (IDC), a research firm in Framingham, Mass.

"People need to communicate beyond their local workgroup; they need to have more cross-enterprise calendaring and scheduling," she says.

Meanwhile, the market is expanding rapidly. Sales of group calendaring and scheduling software will grow from $59.1 million last year to $183 million in 1999, according to IDC. That's a compound annual growth rate of 25%. And the fastest growth is happening right now. Sales are expected to reach $96.7 million this year and $139.7 million next year.

Probably the biggest issue in the market is interoperability. Today's group scheduling packages can't interact with one another.

For example, at the University of Michigan in Ann Arbor, users in the business and finance division use OnTime, a product from Campbell Services, Inc. in Southfield, Mich.

"The market is changing simply because of the increased presence of [electronic mail] and because of natural business forces."

—Linda Myers-Tierney, IDC, Framingham, Mass.

However, users in the information technology department use Meeting Maker from On Technology Corp. in Cambridge, Mass. "We can't interoperate," says Ed Vasquez, systems administrator for the business and finance division. "But for us, it's only a minor nuisance. The majority of the meetings we schedule, about 85% to 90%, are within our division. So it's only a few people who have to worry about it," he says.

Vendors are trying to adopt standards that would ensure interoperability, but so far, the effort hasn't produced much in the way of results.

"Some vendors fear that if they open up their product, then people will stop buying their product," says Anik Ganguly, president of Campbell Services. He says his company promotes the idea of industry standards. "We have confidence in our product," he says.

OnTime has a 10% market share, according to IDC, and ranks third in the market after Microsoft Corp.'s Schedule+ (30%) and Lotus Organizer from Lotus Development Corp. in Cambridge, Mass. (12%). Other leading products, each with less than 10% of the market, include Meeting Maker; Network Scheduler from CE Software, Inc. in West Des Moines, Iowa; and CaLANdar from Microsystems Software, Inc. in Framingham.

For now, the only way for companies to ensure interoperability is to standardize on one scheduler. And the trend has been to standardize on products from Microsoft and Lotus, which bundle scheduling into suites of office applications.

"Ultimately, that trend is going to erode the market for standalone systems," Myers-Tierney says. "By the time the stand-alone vendors do become interoperable with each other, customers will be used to not needing them."

Ganguly disagrees. He says his company might lose sales among small companies that need limited functionality.

"But in big enterprisewide sales, the companies do an evaluation of products, and they buy our product," he says.

However, at Poco Petroleums Ltd. in Calgary, Alberta, the convenience of a suite solution outweighs bells and whistles. After putting up with the lack of interoperability among the products used by different workgroups, the 180-user company standardized this year on Lotus' SmartSuite, including its Organizer scheduler.

"The main reason was that it was a lot easier for us to deal with a single vendor in terms of support," says Darryl Proudfoot, treasurer at Poco. "And really, the scheduler wasn't the driving force in our decision. It was the choice of the 1-2-3 spreadsheet."

A single vendor may prove easier to support, but it also can be dangerous to rely too heavily on one vendor for E-mail and scheduling software, says Shawn Geddis, network analyst at Computing Analysis Corp. in Arlington, Va.

He is a consultant in the information systems department of a company that has 500 users running Meeting Maker on top of Microsoft Mail. The company chose Meeting Maker rather than Microsoft's Schedule+ partly because officials didn't want to hitch their wagon to a single vendor. Geddis says Meeting Maker has better cross-platform support than other products. ■

Scheduling packages *such as Lotus Organizer track the availability of the employees that a user wants to attend a meeting*

Lyons is a freelance writer in Ann Arbor, Mich.

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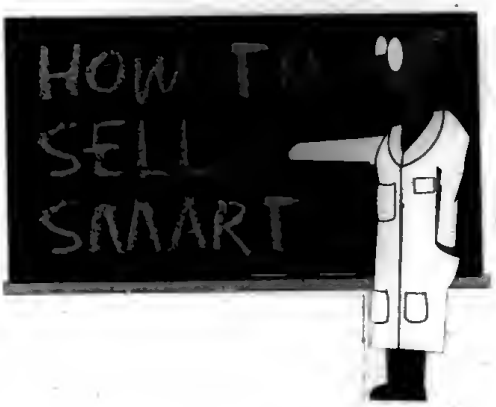

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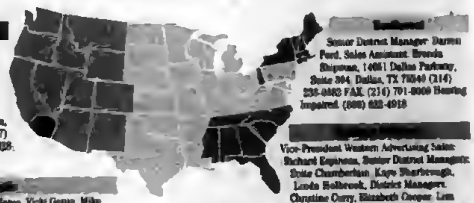

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Gainers / Losers

Percent

Gainers		Losers	
[illegible]	31.6	UUNET Tech.	-19.4
Telxon Corp.	29.3	Netcom On-Line	-28.2
Microphys Lab Corp.	28.0	Xircom	-15.1
Human Systems Inc. (H)	23.7	CE Software (H)	-13.7
Exabyte Corp.	18.4	TriCord Systems (L)	-13.2
Radius Inc. (L)	16.2	Proxim Inc.	-12.0
QMS Inc.	12.6	Apertus Tech.	-11.9
Interbold Inc.	12.6	PairGain Technologies Inc.	-10.1

Dollar

Sun Microsystems Inc.	12.13	[illegible]	-12.75
NetManage Inc. (H)	6.75	Network Peripherals	-10.50
Microsoft Corp.	6.38	Intersolv Inc. Class (H)	-9.25
Novell Corp. (H)	6.38	US Robotics (H)	-7.38
Adobe Systems (H)	5.75	Stratacom Inc.	-7.00
Bolt, Beranek & Newman (H)	5.63	Synoptics Comm.	-6.75
Hewlett Packard Co.	5.00	Intuit Inc.	-5.38
PairGain Technologies Inc. (H)	4.75	Sierra Corp. (L)	-5.00

Making a list, checking it twice

Like many of us this time of year, Wall Street began putting together its holiday greetings card list last week, pulling out the addresses of some established and familiar technology-sector names and adding other more recent, hip acquaintances.

One of the familiar names on the list was **Digital Equipment Corp. (DEC)**. Digital's stock rose close to 10% in two days on recent positive results from benchmark tests of its high-speed Alpha chip technology (see chart). "The Alpha chip is part of its recent [market] success," said Gary Helmig, an analyst at SoundView Financial Group in Stamford, Conn.

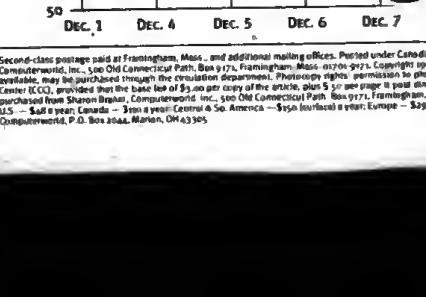
Another old chestnut on the list was **Microsoft Corp. (MSFT)**. Microsoft was downgraded in mid-November by Goldman Sachs & Co. analyst Rick Sherlund.

This past week, Microsoft belatedly outlined a strategy that will help it move into the Internet access provider area (see story page 1). In anticipation of this announcement, Microsoft's stock price rose more than 5% in three days, and Internet access providers **UUNet Technologies, Inc. (UUNT)** and **Netcom On-Line Communications Services, Inc. (NETC)** each fell more than 20% (see chart).

Two other Internet competitors popped up on the seasonal list last week. **Sun Microsystems, Inc. (SUNW)** and **Netscape Communications Corp. (NSCP)** announced an agreement to jointly develop an easy-to-use version of Sun's Java Internet language, called Mocha. A product name just in time for the winter months and something to sip as you work on those holiday greetings cards. — *Stewart Deck*

Some hot, some not

It was holiday cheer for some, ashes and switches for others on Wall Street last week



Exch	52-Week Range			Dec. 8 Wk Net 3 mo	Wk Pct Change
COMS	53.63	20.13	3 COM Corp	40.63	-2.75	-6.3
AIT	57.00	38.00	AMERITECH Corp. (H)	56.00	1.00	1.8
APTS	15.00	6.75	Apertus Tech.	8.13	-1.13	-12.0
T	62.25	47.25	AT&T (H)	46.63	-0.75	-1.1
ASND	50.00	7.38	Ascend Communications (H)	46.75	-3.75	-4.7
BNYN	19.38	6.00	Banyan Systems Inc.	10.50	-0.75	-6.7
BNET	50.00	16.25	Bay Networks Inc.	42.38	-0.69	-1.6
BEL	46.13	38.38	Bell Atlantic Corp. (H)	44.88	0.63	1.4
BLS	41.25	25.88	Bellsouth Corp. (H)	40.88	1.00	2.5
BBN	48.25	33.63	Bolt, Beranek & Newman (H)	44.88	5.63	14.3
BRKT	25.50	8.75	Brooktrout Technology	12.00	-1.38	-5.7
CS	87.25	57.38	Cabletron Systems	76.75	-4.13	-5.1
CSCC	92.50	23.00	Cascade Communications (H)	83.75	1.25	3.5
CGRM	29.13	15.25	Ceragram Communications	20.88	-0.63	-2.8
CSCO	50.38	29.63	Cisco Systems Inc.	39.63	-2.50	-5.9
CLW	11.38	6.13	Compression Labs Inc.	7.25	-0.56	-4.9
CMNT	12.75	4.75	Computer Network Tech.	6.25	0.19	3.1
XCOM	14.30	8.38	CrossCom	13.13	0.88	7.1
DIGI	64.00	26.88	DSC Communications	57.38	2.38	4.3
FORE	62.75	25.00	FORE Systems Inc. (H)	63.50	4.75	8.1
GDC	35.00	9.25	General Datacomm Inds.	19.88	0.75	3.9
GSX	47.38	28.00	General Signal Networks	33.13	0.00	0.0
GTE	43.63	30.00	GTE Corp. (H)	42.63	0.13	0.3
MCIC	27.38	17.25	MCI Communications Corp. (H)	26.75	0.25	0.9
MICM	15.50	5.50	MICOM Communications Corp.	9.13	-0.88	-8.8
MNPI	59.00	8.13	Microcom Inc. (H)	24.00	1.00	4.4
NETM	34.00	13.38	NetManage Inc. (H)	28.25	6.75	31.4
NTRX	10.50	3.63	Netrix Corp.	5.38	0.50	10.3
NCDI	12.00	3.25	Network Computing Devices	7.88	-0.88	-10.0
NWK	47.00	30.25	Network Equipment Tech.	32.25	-0.63	-1.8
NETG	66.50	19.75	Network General	58.00	2.38	4.2
NWTH	42.00	7.25	Net Worth Inc. (H)	41.88	0.13	0.3
NN	45.38	25.00	Newbridge Networks Corp. (H)	41.50	-0.75	-1.8
NT	42.50	31.25	Northern Telecom Ltd. (H)	41.63	1.50	3.8
NOVL	23.25	13.25	Novell Inc.	16.88	-0.38	-2.2
NYN	50.75	35.88	Nynex Corp. (H)	47.75	-2.00	-4.0
OCTL	47.63	17.75	Octel Communications Corp	33.63	0.88	2.7
ODSI	43.25	10.50	Optical Data Systems Inc.	23.00	-1.75	-7.1
PCTL	80.63	9.50	Picturetel Corp. (H)	37.88	0.33	0.9
PTON	10.75	4.25	Photron Inc.	6.88	-0.94	-12.0
RACO	7.88	3.00	Racotek Inc.	5.38	-0.50	-8.5
RETX	5.50	1.81	Retix (L)	3.25	0.00	0.0
SFA	24.88	11.50	Scientific Atlanta Inc.	15.88	-0.75	-4.5
SNVA	77.50	27.50	Sienna Corp. (H)	70.25	-5.50	-6.6
SBC	57.25	50.63	Southwestern Bell Corp.	55.63	0.88	1.6
FON	61.15	75.88	Sprint Corp. (H)	39.38	-0.88	-2.2
SMSC	31.63	12.50	Standard Microsystems Corp.	19.38	-1.50	-4.9
STRM	82.00	26.75	Stratacom Inc.	66.00	-7.50	-9.6
TBIT	8.13	5.38	Telebit Corp	6.63	1.50	29.3
USRX	330.50	16.75	US Robotics (H)	301.00	-7.50	-6.8
USW	48.38	30.38	US West Inc.	32.13	0.88	2.8
XIRC	33.00	8.88	Xircom	11.25	-2.00	-15.1
XLGK	75.00	19.50	Xylogics Inc.	48.00	-0.75	-1.5
AALR	9.63	3.63	Advanced Logic Research	7.25	0.00	0.0
AAPL	63.13	33.63	Apple Computer Inc.	58.56	0.94	5.5
ASTA	19.13	7.50	AST Research Inc.	9.25	-0.75	-3.6
CPQ	56.25	31.13	Compaq Computer Corp.	48.25	0.88	1.8
DELL	49.38	19.38	Dell Computer Corp	38.25	-3.75	-8.9
GATE	57.50	36.00	Gateway 2000 Inc.	37.13	0.75	2.1
HWP	84.00	46.00	Hewlett Packard Co.	84.00	5.00	6.1
MUEI	50.88	6.25	Micron International Inc.	13.63	-0.13	-0.9
NIPNY	75.13	45.13	NEC America	66.00	1.50	2.3
SGI	65.63	57.50	Silicon Graphics	58.50	0.88	2.6
SUNW	96.63	29.88	Sun Microsystems Inc.	86.63	12.13	16.3
AMH	13.63	8.63	Amdahl Corp	9.25	-0.31	-3.3
CNX	9.13	5.69	Convex Computer	6.75	0.13	1.9
CRAY	29.75	14.63	Cray Research Inc.	23.63	-0.25	-1.0
DGN	13.88	6.75	Data General Corp	12.88	0.75	6.2
DEC	44.75	31.13	Digital Equipment Corp. (H)	42.75	4.75	8.7
IBM	114.63	69.38	IBM	95.63	0.13	0.1
MDCD	13.25	3.00	Meridian Data Inc	11.00	-0.63	-5.4
NETF	8.25	4.25	NetFrame	6.25	0.50	8.7
SQNT	35.38	16.13	Sequent Computer Sys.	16.50	-1.25	-7.9
SEQS	10.00	3.13	Sequoia Systems Inc.	5.63	0.33	2.1
SRA	39.88	23.00	Stratus Computer Inc.	32.38	-1.13	-3.4
TDM	38.75	30.00	Tandem Computers Inc.	31.88	-0.13	-1.0
TRCD	6.30	2.63	TriCord Systems (L)	5.69	-0.38	-12.2
UIS	13.63	5.50	Unisys Corp	5.88	-0.63	-9.6
ADBE	74.25	27.25	Adobe Systems Inc. (H)	70.50	3.63	5.4
AMSWA	8.75	2.30	American Software Inc.	6.38	0.25	4.1
APLX	47.50	9.75	Applix Inc. (H)	41.25	1.38	3.4
ARSW	47.75	31.25	Arbor Software (H)	46.50	5.75	14.1
ACAD	53.00	31.25	Autodesk Inc.	37.75	5.13	6.0
BACH	7.88	3.00	Bachman Info. Systems	7.63	0.94	14.0
BGSS	47.00	37.00	BGS Systems Inc.	36.75	-0.25	-0.7
BMCS	51.50	20.50	BMC Software Inc.	40.25	-0.63	-1.5
BOGL	26.38	16.38	Bogle & Babbage (H)	24.50	0.54	2.3
BORL	50.63	8.00	Borland Int'l Inc. (H)	38.63	0.63	1.5
CESH	3.94	1.58	CE Software (H)	3.75	-0.44	-15.7
CYE	26.38	13.75	Cheyenne Software Inc. (H)	26.38	2.88	12.2
COGNF	61.00	13.25	Cognos Inc. (H)	60.25	0.38	1.3
CA	79.50	26.75	Computer Associates (H)	63.00	0.13	0.2
CVN	14.38	3.00	Computervision Corp.	11.75	-0.63	-5.1
CPWR	43.00	37.50	Compuware Corp.	39.50	0.50	1.3
CSRE	25.25	7.25	Consware Inc.	24.38	-0.13	-0.5
COSFF	19.50	10.13	Corel Corp	16.94	-0.44	-2.7
DWTI	56.25	9.00	Database Technologies Inc.	10.38	-0.75	-6.7
DSLGF	32.25	14.13	Discreet Logic Inc.	30.50	-1.00	-3.2
FILE	51.00	23.00	Filenet Corp.	40.25	-2.00	-4.7
DODDF	8.25	5.38	4th Dimension	6.63	0.63	10.6
FTPS	80.63	20.25	FTP Software Inc. (H)	33.50	1.13	3.5
GSOF	26.00	9.25	Group I Software	11.00	0.50	4.8
GPTA	19.30	6.38	Gupta (L)	6.88	0.50	5.8
HOGN	12.13	6.63	Hogan Systems Inc. (H)	11.75	3.75	23.7
HYSW	56.75	31.25	Hyperion Software Corp	42.25	-2.50	-5.3
IRIC	16.63	10.00	Information Resources	11.56	-0.56	-4.6
IFMX	34.38	12.75	Informix Corp.	28.13	3.25	4.7
INGR	10.50	7.38	Intergraph Corp.	17.00	-0.63	-3.5
LEAF	12.63	2.88	Interleaf Inc.	11.00	-1.00	-8.3
ISLI	26.75	8.75	Intersolv Inc.	12.50	1.00	17.6
INTU	58.25	50.63	Intuit Inc.	77.88	-5.50	-6.5
MGICF	11.50	3.63	Magic Software Enterprises	8.25	0.13	1.5
MANU	20.50	6.75	Manugistics Group Inc.	17.13	0.00	0.0
MAPS	40.00	17.25	Mapinfo Corp	29.75	2.25	11.5
MATH	7.38	2.00	MathSoft	5.63	0.25	4.7
MCAF	53.00	8.75	McAfee Associates (H)	46.63	-2.75	-5.6
MENT	22.00	12.50	Mentor Graphics	19.00	-0.63	-3.2
MFGY	14.75	8.63	Micro Focus	8.25	-0.38	-4.4
MGID	13.88	5.13	Microgram Inc.	11.38	-0.13	-1.1
MSFT	109.25	58.25	Microsoft Corp	93.00	6.38	7.4
ORCL	48.75	29.75	Oracle Corp	46.00	1.50	3.4
PMTC	72.56	31.25	Parametric Technology (H)	65.63	-3.19	-4.5
PARQ	22.75	6.63	ParcPlace Systems Inc.	10.00	1.13	10.1
PSFT	67.00	14.75	Peoplesoft	47.50	0.88	1.3
PTEC	14.38	6.13	Phoenix Technologies	11.63	-0.63	-5.1
PSQL	16.88	4.88	Platinum Software	8.00	-0.44	-5.8
PLAT	26.00	13.38	Platinum Technology	15.25	1.31	7.9
PROG	35.25	17.75	Progress Software Corp	32.75	1.75	5.6
RNBO	26.75	15.63	Rainbow Technologies Inc.	24.25	1.75	7.8
ROSS	7.25	2.19	Ross Systems	3.13	-0.19	-3.8
SOTI	58.25	7.00	Security Dynamics Tech. (H)	48.00	-4.00	-7.7
SKEY	51.75	19.13	Softkey International Inc.	30.75	0.81	2.7
SPCO	5.63	2.88	Software Publishing Corp	3.63	0.38	11.5
SOTA	33.50	6.25	State of the Art	10.00	-0.50	-5.6
SSW	61.50	31.25	Sterling Software Inc. (H)	56.00	-0.69	-1.2
SDRC	21.88	4.63	Struct. Dynamics Research	15.88	0.50	3.2
SYBS	55.00	19.88	Sybase Inc.	35.00	-0.38	-1.1
SYMC	33.25	15.50	Symantec Corp	28.88	-0.13	-0.5
SNPS	38.50	19.75	Synopsys	35.75	0.50	1.4
SSAR	45.75	14.25	System Software Assoc.	31.25	3.00	8.7
SYSF	18.13	6.75	Systemsoft Corp.	14.00	0.50	3.7
TRUV	10.13	2.00	Truevision Corp.	7.88	0.38	5.0
VIEW	31.50	7.00	ViewLogic Systems	25.38	-0.13	-0.5
VMRK	31.50	6.00	Vmark Software Inc. (L)	6.25	-0.13	-2.0
WALK	9.25	4.63	Walker Interactive Systems	7.38	-0.25	-3.3
WALL	55.50	34.50	Wall Data Inc.	37.88	2.50	35.3
WANG	38.50	9.13	Wang Laboratories Inc.	17.13	-0.56	-3.2
AMER	46.75	10.25	America On-Line (H)	40.88	0.50	1.2
NETC	91.50	19.00	Netcom On-Line	51.00	-20.00	-28.2
NSCP	176.50	45.75	Netscape Comm. Corp. (H)	126.38	-9.25	-6.8
QDEX	59.38	3.00	Quarterdeck Corp. (H)	34.75	1.13	3.3
SPYG	121.00	26.50	Spyglass Inc. (H)	98.00	-6.75	-6.4
UUNT	98.75	75.75	UUNET Tech	88.75	-22.75	-20.4
AMD	39.75	19.38	Advanced Micro Devices (L)	19.63	0.00	0.0
ADI	58.50	28.50	Analog Devices Inc.	36.00	-0.75	-2.1
CHPS	15.88	6.25	Chips And Technologies	10.50	0.50	5.0
CRUS	61.13	50.50	Cirrus Logic	50.13	-3.63	-6.7
CY	57.75	30.38	Cypress Semiconductor Corp.	34.75	-0.38	-1.1
INTC	78.38	58.75	Intel Corp	62.00	1.00	1.6
LSI	62.50	18.25	LSI Logic Corp	37.13	-1.63	-4.2
LSCC	62.00	15.81	Lattice Semiconductor	31.00	3.13	11.4
MCRL	32.50	11.75	Micrel Semiconductor Inc.	15.50	-3.00	-16.1
MU	94.75	20.50	Micron Technology	52.38	-0.25	-0.5
MOT	82.50	51.38	Motorola Inc.	60.25	-0.13	-0.2
NSM	33.63	16.50	National Semiconductor	22.38	3.38	16.5
SMTK	28.75	6.63	Sierra Semiconductor	17.00	-1.50	-8.1
TXN	83.75	12.75	Texas Instruments	54.50	-0.75	-1.4
VLSI	39.13	30.63	VLSI Technology	31.88	0.63	2.0
WWTK	6.88	1.78	Wavtek	3.56	-0.13	-3.7
WDC	52.13	15.13	Western Digital Corp	17.25	1.75	10.8
XLNX	55.50	15.13	Xilinx	36.63	2.50	7.3
ZLG	54.33	20.50	Zilog Inc.	35.00	-1.75	-3.8
APCC	25.50	9.38	American Power Conversion	20.63	0.31	3.0
ADPT	48.38	19.88	Adaptec Inc. (H)	45.38	-1.00	-2.2
BTEC	22.75	14.75	Banctec Inc.	20.88	0.75	3.8
CBER	33.13	3.56	Cambex Corp	8.25	0.00	0.0
CGN	7.75	1.94	Cognitronics Corp. (H)	8.50	0.38	6.1
CNR	23.75	8.50	Connner Peripherals	13.25	1.00	8.1
CREAF	39.38	5.50	Creative Technologies Inc.	31.00	1.63	37.3
RACE	13.13	3.50	Data Race Inc.	5.00	-0.50	-9.1
DTM	9.38	4.50	Datum Inc Corp	7.00	-0.25	-3.4
EMC	22.50	13.50	EMC Corp.	17.38	-0.13	-0.7
EMLX	20.38	10.00	Emulex Corp	14.50	3.75	18.4
ESCC	25.25	11.25	Evans & Sutherland (H)	22.25	1.50	4.2
EXBT	21.75	10.00	Exabyte	17.13	0.63	3.8
IBSLF	4.25	1.50	Intelligent Info. Systems	2.06	-0.18	-8.3
IOMG	53.75	2.88	Iomega Corp .80	48.63	6.38	35.1
IPLSA	7.88	2.00	IPL Systems Inc.	3.38	0.25	8.0
KMAG	24.88	22.25	Komag Inc.	24.00	1.13	6.0
MXTR	7.63	3.88	Maxtor Corp	6.38	0.06	1.0
MLIS	11.50	3.50	Micropolis Corp	4.00	0.88	28.0
MTSI	47.50	13.50	Micro Touch Systems Inc	16.50	-0.50	3.3
PEAK	31.75	14.00	Peak Technology Group	29.50	1.25	4.4
PWCL	39.30	8.75	Pinnacle Micro Inc	38.25	0.50	1.8
PTNX	38.75	16.00	Printronix Inc	37.00	1.50	4.1
QMS	94.13	3.75	QMS Inc	3.00	0.75	17.6
QNTM	58.50	33.75	Quantum Corp	37.75	1.15	4.0
ROUS	15.00	1.94	Radius Inc. (L)	5.44	0.50	10.2
SEG	54.50	22.50	Seagate Technology	33.75	3.50	3.0
STK	33.25	17.88	Storage Technology	25.38	0.88	3.6
TEX	61.50	31.38	Textronix Inc.	45.25	1.50	2.0
XRX	144.63	50.63	Xerox Corp. (H)	142.13	4.63	3.4
AMSY	31.75	15.88	American Mgmt Systems	29.88	0.88	3.0
ANLY	33.00	18.00	Analysts Int'l	30.75	1.25	4.2
AUD	62.75	52.50	Auto Data Processing (H)	61.63	1.75	3.3
CATP	61.00	37.00	Cambridge Tech. Partners	52.63	1.38	2.7
CEN	47.50	23.38	Cepheun Corp	42.38	0.63	3.5
CDO	34.50	30.00	Comdisco Inc. (H)	33.88	0.88	2.7
CHRZ	37.38	8.88	Computer Horizons (H)	36.00	1.75	5.1
CSC	79.25	63.00	Computer Sciences (H)	75.13	3.38	1.9
TSK	20.88	7.75	Computer Task Group (H)	18.50	0.50	2.8
CPU	44.38	12.50	CompuUSA Inc.	30.29	-0.35	-0.7
CDAT	19.25	3.50	Control Data Systems Inc. (H)	19.25	2.25	13.2
EGGS	14.25	6.63	Egghead Discount Software	7.88	-0.31	-3.8
GME	52.38	26.00	General Motors E (EDS) (H)	51.13	0.25	0.5
IMAC	35.25	8.88	Imacon Corp	12.06	-0.69	-5.7
INEL	14.63	6.25	Intelligent Electronics	9.13	0.63	9.6
MSEL	8.63	3.88	Memsel	4.88	0.63	14.7
MICA	33.00	9.13	Micronade Inc.	8.88	0.75	9.3
PAYR	42.00	23.25	Paychex	42.75	-2.50	-5.5
PMS	56.25	27.75	Policy Management Sys.	45.00	0.50	1.1
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SAIC	34.50	16.75	SEI Corp	22.25	1.63	7.3
SMED	46.38	30.00	Shared Medical Systems	46.38	3.38	7.8
SMKR	13.13	4.06	SMI Systemhouse	13.63	0.00	0.0
SSPE	26.50	14.00	Software Spectrum Inc	19.38	-0.25	3.9
SNDT	31.75	17.75	Sundard Data Systems	30.25	5.75	0.8

KEY (H) = New annual high reached yesterday (L) = New annual low reached yesterday

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AS/400 users

CONTINUED FROM PAGE 1

add a machine within two months to boost capacity in Texas and Oklahoma. Even with the discounts IBM is dangling, that could cost Enterprise $600,000 or more and saddle it with a system that will quickly lose resale value after the RISC hardware ships, he added. A straight upgrade to RISC would cost about $300,000 if those boxes were available.

> "There's just not the horsepower [on our AS/400s] anymore for most of what we've set up."
>
> — Marc Cohn, Enterprise Rent A Car

Gannett Co. expects to buy two more non-RISC AS/400s by February to plug capacity holes. "I got hurt in a couple of places because of the delay on RISC," said Scott Plumer, director of platforms and integration services at the Arlington, Va., company.

Even if the RISC boxes ship in the first quarter as promised, Gannett probably won't migrate to them until next fall, Plumer said. The new hardware, its companion operating system and IBM's support capabilities all must mature, "and it ain't going to be March or April when we get that," he said. But IBM's discount medicine is making the delayed transition easier to swallow, he added.

"We obviously had some [customers] that were out in a very happy situation. Their growth was ahead of our curve," said Pat Blair, manager of large account marketing at IBM's AS/400 Division. IBM is working with shops one-on-one to try to provide short-term relief, he added.

Besides discounts, IBM is offering its OptiConnect clustering technology, application tuning services, low-interest leases with deferred payments and interim rental systems.

"In most cases, IBM has been able to glue something together with duct tape and chewing gum," said David Andrews, a consultant at D. H. Andrews Group, Inc. in Cheshire, Conn. But some customers must "live with performance that they don't like" while waiting for RISC, he said.

Microsoft

CONTINUED FROM PAGE 1

tricity division. It's just assumed in what we do," he said.

Microsoft will build Java access into its Internet Explorer browser. Java Script, a lightweight programming language meant to simplify writing World Wide Web applications, was introduced last Monday by Sun and Netscape Communications Corp.

"I believe that Microsoft has realized that when they come to the Internet, they have to play by the Internet rules," said Jon Kannegaard, chief operating officer of Sun's new Java Products Division.

One of the rules levied on Java licensees is that any extensions they create must be made publicly available.

Visual Basic following

In a related move, Oracle Corp. announced that, even though it is a Java licensee, it also will license Visual Basic Script, Microsoft's new competitor to Java Script (see related story at right).

Java is perceived as the scripting language of choice for Web aficionados, but Visual Basic has a following of more than 3 million users. The OCX technology provides benefits similar to Java "applets," including the ability to merely drag and drop in order to use them. Microsoft's move aims to give users their druthers.

"I'm pleased to see [Microsoft] supporting other good work that's been done, as opposed to reinventing it themselves and slowing down its availability to users," said Todd Cotton, consulting project manager at Hewlett-Packard Co. in Palo Alto, Calif. HP uses the Internet for projects that require the sharing of information, including internal design work.

Hey neighbor! *Microsoft's Internet Assistant will take browsing users to new places on the Web, including the home page of rival Sun Microsystems*

What's in the offing

The pieces of Microsoft's Internet strategy include the following:

- The company will build "one-button" access to the Internet into Windows 95 next year.
- It has begun shipping beta versions of its Internet Explorer 2.0 that will run on Windows 3.1, Windows NT Workstation and the Macintosh. The current Internet Explorer runs only under Windows 95.
- It will integrate its Internet Information Server, code-named Gibraltar, into Windows NT Server next year. Its other Internet servers for creating firewalls and for electronic commerce will be bundled into the BackOffice server suite next year. Its Media Server, code-named Tiger, also will be bundled into BackOffice.
- Spyglass, Inc. will enhance its Mosaic Web browser for Unix, the Macintosh and Windows to support OCXs and Visual Basic Script and the latest Hypertext Markup Language extensions.
- Microsoft demonstrated an upcoming version of its Internet Explorer browser that lets users see where they are on the Internet, as the Explorer file management utility does in Windows 95.

Some users have been after Microsoft to support Java. Fulcrum Technologies, Inc., which provides a key search engine for The Microsoft Network, has been beta-testing Microsoft's Internet products for several months.

Senior editor Jean S. Bozman contributed to this report.

Java gets boost from middleware vendors. See page 79.

Oracle welcomes Microsoft

"The Internet today is like the Wild West, and a guy who was in your lynch mob yesterday will be in your posse tomorrow."

With those words, Oracle official Marc Benioff summed up the feeling behind last week's announcement that longtime rival Microsoft Corp. will license Oracle Corp.'s PowerBrowser OCX software and distribute it to third-party developers.

PowerBrowser OCX automates the flow of information between client/server applications and the Internet. With support for OLE controls (OCX), Oracle PowerBrowser OCX is the industry's first embeddable Web browser, said Benioff, Oracle's senior vice president of Web/workgroup systems. Developers will be able to use and redistribute Oracle PowerBrowser OCX without paying royalty fees.

Oracle in turn will license Microsoft's Visual Basic Script and include it in Oracle's PowerBrowser Web browser, which runs under Windows and Mac OS. Visual Basic Script will let developers create, link and automate objects in Web pages, Oracle said. It is a subset of Microsoft Visual Basic programming language.

No licensing terms were disclosed. — *Dan Rickman*

PC prices tumbling

CONTINUED FROM PAGE 1

On average, users will spend about 33% more next year on PC hardware purchases and upgrades, driven primarily by Windows 95, according to Workgroup Strategic Services, Inc. in Portsmouth, N.H. That figure is based on data the firm collected by tracking corporate migrations to Windows 95.

U.S. shipments of PCs hit 15.9 million units during the first three quarters, which is almost 21% higher than shipments in the same period last year. Pentium sales last year accounted for only 14.5% of total unit shipment, but they rocketed this year to 46% of the total shipments, according to International Data Corp. in Framingham, Mass.

As users bulk up, they are changing the profile of installed PC hardware in their corporations. They are investing in larger systems with features such as snazzy monitors, CD-ROM drives, business audio and three-dimensional graphics.

"We are looking at a spending increase of between 40% to 50% next year on PC hardware," compared with this year, said David Hamm, senior sales and financial consultant at Northwestern Mutual Life Insurance Co. in Milwaukee. The company will buy 1,500 to 1,800 Pentium PCs to replace aging 386-based desktops at its scattered field agent locations.

Desktop budgets

The hardware upgrades are driven mainly by a planned transition to Windows 3.1. The company this year already has purchased about 1,000 90-MHz Pentium systems, each with an average of 16M bytes of RAM and about 1G byte of disk space.

In the process, the company boosted Pentium presence from about 5% at the beginning of the year to about 18% now. Such purchases and upgrades are becoming typical, industry observers agreed.

Associated Grocers, Inc. in Seattle has "pretty much standardized on Pentium. Even the notebooks we buy are no longer" based on 486s, said Tom Balzarini, an enterprise network specialist at the company.

Such standardization is changing installed hardware profiles at many corporations.

For instance, the average hard disk drive and memory configurations have almost doubled in the past year at Advanced Technology Laboratories (ATL), a manufacturer of diagnostic medical equipment in Bothell, Wash. Average disk drive sizes have grown from 700M bytes to 800M bytes, while memory has gone from 8M bytes to 16M bytes.

Bigger configurations also have made it possible for the company to off-load some noncritical applications to local hard disk drives, said Fred De Boer, director of network services at ATL. "We have reduced network traffic, increased storage space on the servers and improved network functionality," he said.

Upgrades continue

The company plans to continue upgrading its hardware next year, but the cost of moving to Windows 95 was prohibitively expensive. "Even our conservative estimates for the migration shocked the heck out of us," De Boer said.

Hardware upgrades to accommodate more applications also are becoming typical. "Every time we look back, we find out we have underestimated our requirement for hard drives," said Glen Jurmann, section manager of office technology at Baxter Healthcare Corp. in Chicago.

PC sales price tags slip, but no price war is expected. See page 54.

Sun's Java is steaming hot

Charles Babcock

Sun Microsystems' Java language, which is used to build World Wide Web pages, is so hot it has become an industry buzzword. And now there will be Java Script, a simplified command shell on top of the language that will help novice users build Web pages without having to learn the full language.

The youthful Java's fortuitous life story can be summed up as 15 minutes until fame. But Java isn't intricate, sophisticated technology as much as it is a stripped-down version of C++. Within Sun's hallowed halls, founder Bill Joy jokingly refers to it as "C plus-plus-minus-minus."

One of the ways Java is different from C++ is in its ability to check for bugs early and build more reliable programs. Java allows only single inheritance for an object class instead of multiple inheritance. Multiple inheritance gives C++ programmers the chance to use flexibility and confusion in their labors.

But Java, like C++, can be used to build and activate objects, improving on static Hypertext Markup Language-based home pages. It also has a library of routines to interface to TCP/IP protocols.

Through these routines, it can move messages and files around the Internet. Java-based Web pages can behave interactively, and an Internet server can download an applet upon request to a home page visitor's client.

Most home pages use colors and underlined text to convey a message. A Java-based home page can download snippets of voice or video. More than one thing can be happening on the page at a time. That's plenty to qualify Java as hot.

Java is platform-neutral, but it has been optimized to take advantage of multithreaded operating systems such as Sun's Solaris. Interactive applications are much more impressive, with the processor seeming to act on multiple data streams at once.

All of this leaves Sun in a strong position to exploit the Internet and perhaps even change the character of its use. What if people could access Internet servers from a cheap $200 to $300 device that had no hard drive or programs residing on it? Instead, they could download applets off a nearby Internet server or through an Internet access provider. Then Java could supply interactive applications in home banking, local government, home education and entertainment.

Sun's rich experience with objects will allow it to push Java forward at a rapid pace.

That isn't going to happen yet because the most avid Internet users also are devoted PC or workstation users. They have little interest in a separate dial-up device. But the easy-to-use applications that Java will make possible may boost the feasibility of such a device.

Java will face some competition from Microsoft's Blackbird, which was designed to do some of the same things with Microsoft's OLE and other technologies on Windows NT servers.

But Java already commands a great deal of mind share among Web developers and has important allies in Netscape Communications, Borland and Oracle.

As Java continues to gain support, third-party developers are flocking to it. Sun's rich experience with objects and development tools will let it push Java forward at a rapid pace.

If Sun and Netscape act as though they are going to make Java the best possible language they can for the Internet, they are likely to command the mind share among third-party developers that leads to market share.

As Microsoft has taught us so well, he who stands astride an emerging wave of computing can, through leadership, practically guarantee that an irresistible cluster of technologies will be generated to support an emerging environment. And that allows the core technology to dominate.

* * *

Speaking of new languages, Borland has scored a surprising hit with the Delphi visual programming language. Delphi was introduced in February. It is a Microsoft Visual Basic look-alike that comes with 75 generic components and an ability to use Visual Basic controls or OLE objects.

Delphi has a major advantage over Visual Basic and PowerSoft's PowerBuilder: Applications built with Delphi source code can be compiled; competitors remain slow-to-execute interpretive languages. Borland is no slouch when it comes to writing compilers. Delphi 2.0, which is due early next year, makes use of Borland's noted 32-bit C++ compiler on the back end. Borland claims Delphi-generated code runs 15 times faster than Visual Basic and 815 times faster than PowerBuilder.

Babcock is *Computerworld*'s technical editor. His Internet address is charles_babcock@cw.com.

Inside Lines

This monkey inhaled

The Stoned.Monkey virus made a monkey out of Esys Corp., a vendor of E-mail and messaging software in Edmonton, Alberta. The company was checking out a stack of demo diskettes for its new product when it discovered Stoned.Monkey on one diskette. Some demos already had been mailed to potential customers and members of the press. Esys had to get on the phone and warn the recipients — all 97 of them — that they might be infected. "What a pain in the butt this has been, I don't mind telling you," said Don McCormick, marketing director.

Cyberwhine

Pouting Microsoft Chairman Bill Gates shed some light on how prepared Microsoft was for the Internet explosion, which he said has a "gold rush" atmosphere. "Maybe it's fun to say we're late," Gates said last week, responding to a question during a speech about *The Road Ahead*. Microsoft had several "retreats" on the subject, Gates said, "Who knew that on this date, it would be as big as it is? Is there someone? Crown the guy." Touchy!

Not so top secret

A reliable source says the White House will hold a major event in Washington in January to present its ideas about key-escrow encryption to senior government managers. Key escrow is the concept, previously known as "Clipper," to establish an encryption standard that can be broken by the government in wiretaps. The seminar coincides with the annual RSA Data Security conference in San Francisco, the sine qua non event of the crypto community.

Behind the PACE?

3Com this week will detail internetworking products that will be available with support for Priority Access Control-Enabled (PACE) technology. PACE technology was designed to support multimedia applications over switched Ethernet links. The vendor announced the technology with much hype in October 1994.

The 5th Wave by Rich Tennant

"NOW, THAT WOULD SHOW HOW IMPORTANT IT IS TO DISTINGUISH 'FERTILIZING PRACTICES' FROM 'FERTILITY PRACTICES' WHEN DOWNLOADING A VIDEO FILE FROM THE INTERNET."

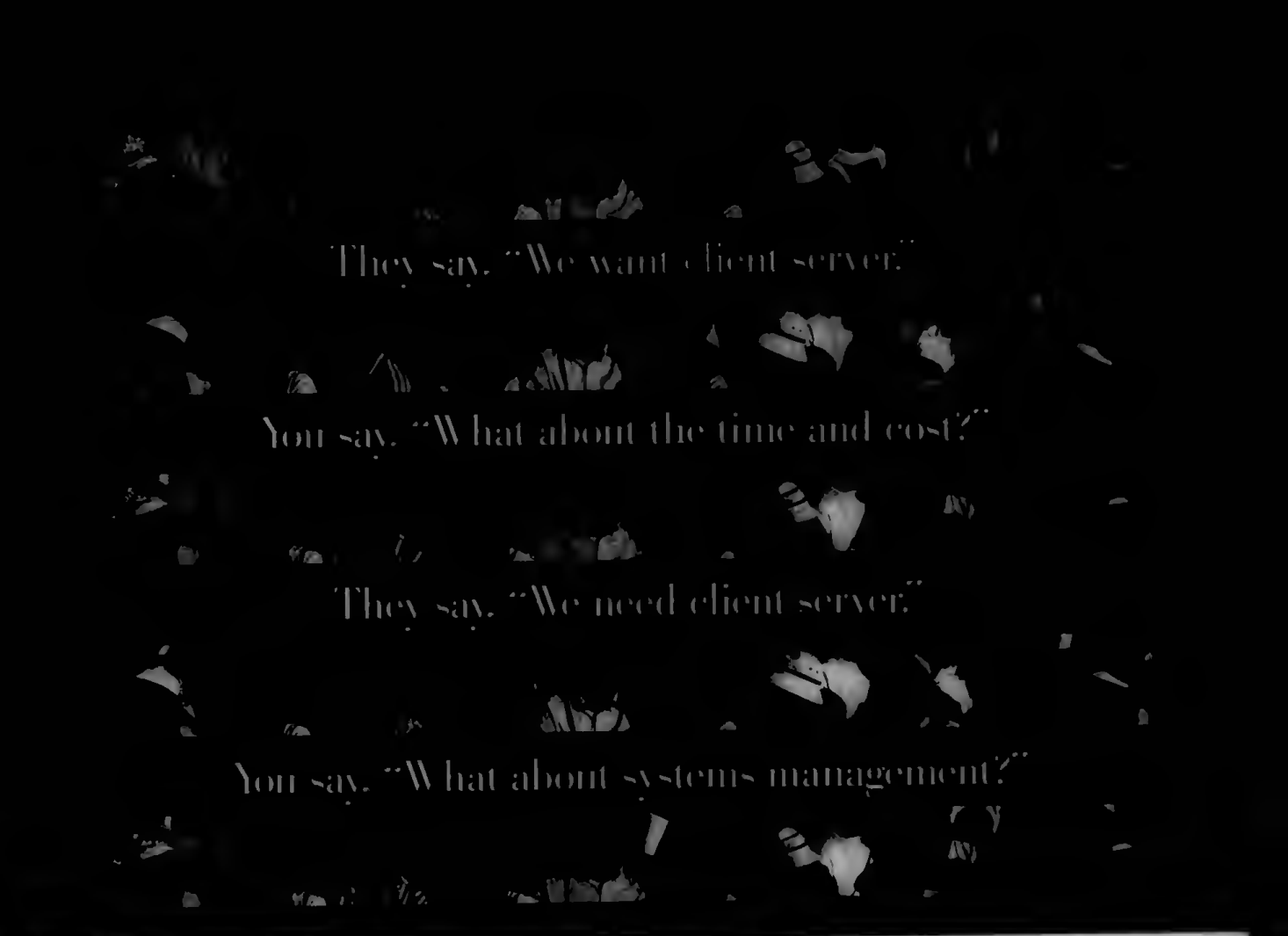
No saps here

Oracle's applications business is stepping up its competition with SAP AG in key vertical markets. Oracle this week will name Nimish Mehta to the newly created post of senior vice president of vertical client/server applications. Vertical industries that the new Oracle group will target include consumer packaged goods, oil and gas, government, education and financial services. Mehta was formerly vice president of Oracle's workgroup solutions division.

Gimme shelter

When Microsoft dropped its Internet strategy bomb last week on the anniversary of the attack of Pearl Harbor, it may have exploded at least part of Netscape's livelihood, according to some analysts. The Big M's decision to make World Wide Web server capabilities an option built right in to the NT operating system "automatically devalues" Netscape's own NT-based Web server products, said a Wall Street analyst. Netscape also sells Unix-based Web servers, "but now anyone buying NT can just get the Web features right there, rather than buying a separate product," the analyst noted.

Around here, we never know what will come in the mail. Condom vendor Durex Corp. sends a mouse pad, screen saver and release promoting a Web site for romantic encounters, while fax developer Brooktrout Technology, Inc. ships a gourmet loaf of bread baked in the shape of its namesake. If anything unusual has crossed your desk lately, contact Computerworld *with your tip on our 24-hour voice-mail tip line at (508) 820-8555 or our toll-free number at (800) 343-6474. News editor Maryfran Johnson can be reached by phone at (508) 820-8179 or via the Internet at maryfran_johnson@cw.com.*



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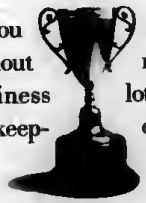

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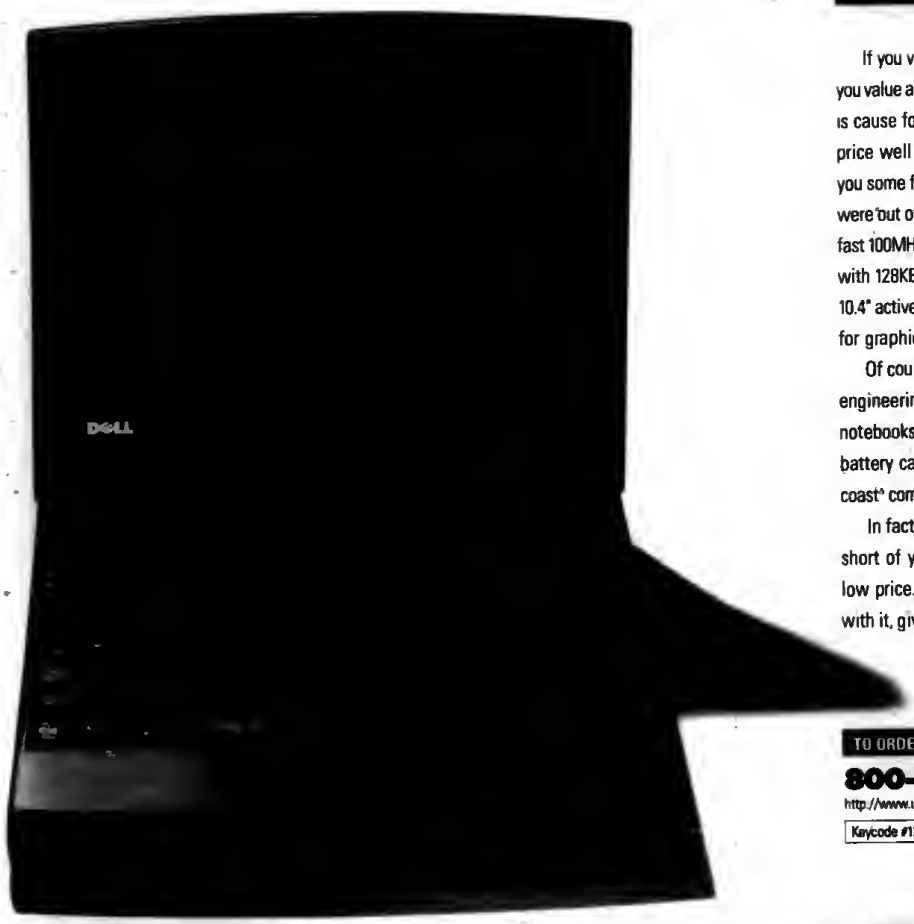

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